APPENDIX.

IN THE

UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF INDIANA,
HAMMOND DIVISION.

UNION CARBIDE CORPORATION, Plaintiff, *vs.* GRAVER TANK & MFG. CO., INC., and THE LINCOLN ELECTRIC COMPANY, Defendants.	Civil Action No. 607.

MASTER'S REPORT.

TO THE HON. LUTHER M. SWYGERT, JUDGE OF THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF INDIANA, HAMMOND DIVISION:

The undersigned Henry R. Sackett, Special Master, respectfully submits the following report:

I. PRIOR PROCEEDINGS.

This is an action for patent infringement involving plaintiff's United States Patent No. 2,043,960. The following briefly indicates the proceedings in this cause prior to the order of reference made by your Honor under date of February 10, 1953:

October 1, 1945. The complaint was filed.

January 2, 1947. The trial started before your Honor and lasted three weeks. After the trial, lengthy briefs and reply briefs were submitted; then there was a full day of oral argument; also both sides submitted proposed findings of fact and conclusions of law.

June 6, 1947. Your Honor rendered his opinion and made findings of fact and conclusions of law (86 F. Supp. 191). Your Honor held Claims 18, 20, 22 and 23 valid and infringed and held the other claims invalid.

July 9, 1947. Your Honor issued an interlocutory decree providing for an injunction and an accounting for damages. The decree was suspended by supersedeas upon the posting of a $300,000 bond by the Lincoln Company.

April 16, 1948. The Court of Appeals for the Seventh Circuit unanimously affirmed your Honor's decision that Claims 18, 20, 22 and 23 were valid and infringed and reversed the holdings of invalidity as to the other claims (167 F. 2d 531).

October 11, 1948. The Supreme Court granted certiorari.

February 28, 1949. The unanimous decision of the Supreme Court was handed down (336 U. S. 271). That decision up [illegible] our Honor in all particulars.

May 16, 1949. The Supreme Court granted a petition for rehearing limited to the issue of infringement (337 U. S. 910).

May 29, 1950. The Supreme Court rendered its second decision reaffirming its original decision in all respects (339 U. S. 605).

July 10, 1950. Pursuant to the mandate of the Supreme Court, Your Honor issued the writ of permanent injunction.

October 9, 1950. Defendants' second petition for rehearing by the Supreme Court was denied (340 U. S. 845).

December 1, 1950. The plaintiff brought its motion to adjudge the defendants in contempt of court.

December 30, 1950. Plaintiff, The Linde Air Products Company, was merged into its parent Union Carbide and Carbon Corporation and on April 4, 1951, the latter was substituted as party plaintiff.

September 10, 1951. There was a hearing on plaintiff's motion for reference to Special Master.

November 5, 1951. The trial of the contempt proceedings started before Judge Dewey sitting by special assignment and lasted more than two weeks and was followed by briefs and oral argument.

November 26, 1951. Judge Dewey rendered his opinion in favor of plaintiff (106 F. Supp. 389).

December 10, 1951. There was a hearing and Judge Dewey settled and signed findings of fact and conclusions of law and the order and decree.

March 26, 1952. The Court of Appeals unanimously reversed Judge Dewey's decision (196 F. 2d 103).

June 2, 1952. The Supreme Court denied certiorari (343 U. S. 967).

October 13, 1952. The Supreme Court denied petition for rehearing (344 U. S. 849).

November 26, 1952. Plaintiff served motion to refer the accounting to a Special Master. Defendants countered with a motion for a determination that plaintiff should be accorded no further relief, that is, "that plaintiff take nothing". There were proceedings in the District Court including briefs and a hearing before Your Honor on January 9, 1953.

February 10, 1953. Your Honor signed the order of reference appointing the Special Master to take and state the account.

II. The Order of Reference.

This cause was referred to the Master by order made by Your Honor on February 10, 1953. A copy of the order of reference is annexed hereto as Appendix "A".

III. ORDER OF MASTER TO DEFENDANTS TO APPEAR AND FILE STATEMENTS OF ACCOUNT.

The plaintiff served a proposed draft of an "Order of Master to Defendants to Appear and File Statements of Account", and defendants filed written objections thereto. Hearings were held with reference to said objections and the settlement of said order and briefs were submitted.

On June 20, 1953 the Master handed down a memorandum of decision, a copy of which is annexed as Appendix "B".

On the same date, June 20, 1953, the Master signed the Order to Defendants to Appear and File Statements of Account, a copy of which is annexed hereto as Appendix "C".

On July 21, 1953 defendants made a motion in the District Court for an order directing the Master to strike paragraph 4 from the order of June 20, 1953. The parties submitted briefs and the motion was argued before Your Honor on October 1, 1953. On November 25, 1953 Your Honor handed down a decision, a copy of which is annexed hereto as Appendix "D".

On December 21, 1953 defendant Lincoln Electric Company filed a motion in the United States Supreme Court for leave to file a petition for a writ of mandamus. On February 1, 1954 the United States Supreme Court denied said motion (347 U. S. 902).

IV. ORDER STATING ISSUES.

Statements of account were filed by defendants; and the parties had the benefit of extensive discovery in the course of the proceedings before the Master. Both sides examined and cross-examined witnesses, and both sides also responded to requests for the production of documentary material from their files. The plaintiff also responded to interrogatories served by the defendants.

In the course of the proceedings before the Master, drafts of an order stating the issues were submitted by the parties.

In order to frame the issues it was necessary that the Master make a ruling as to the finality of certain findings of fact made by Your Honor under date of June 6, 1947. The parties submitted briefs and presented oral argument with respect to this matter. The Master handed down a memorandum of decision on February 29, 1956, a copy of which is annexed hereto as Appendix "E".

The Master also made a ruling with respect to defendants' contention that the welding process and the flux were two separate things. The parties submitted briefs and presented oral argument with respect to this matter. The Master handed down a memorandum of decision on February 29, 1956, a copy of which is annexed hereto as Appendix "F".

On March 28, 1956 the Master signed the Order Stating the Issues, a copy of which is attached hereto as Appendix "G".

V. The Trial.

The trial of the issues was held before the Master at Gary, Indiana, starting on September 24, 1956 and ending on October 24, 1956. Both sides called witnesses, who were examined and cross-examined, and also presented other evidence. Defendant Lincoln Electric Company presented demonstrations of actual welding and other demonstrations.

Both sides submitted their briefs and proposed findings of fact. The oral argument was presented on March 18 and 19, 28 and 29, 1957 after which there was further briefing.

As provided in the Order of Reference and Rule 53(e)(5) of the Federal Rules of Civil Procedure, the Master submitted to counsel a draft of his report more than thirty (30) days prior to filing for the purpose of receiving the suggestions of counsel. Numerous suggestions were made in writing by counsel, after which a hearing was held and certain suggestions were accepted and adopted and other changes were made by the Master, after which the Master's Report was put into its final form as herein contained.

VI. Findings of Fact.

1. This is an action for patent infringement, commenced October 1, 1945, involving plaintiff's U. S. patent No. 2,043,960. Plaintiff was originally The Linde Air Products Company; that company has now been merged with its corporate parent, Union Carbide and Carbon Corporation, and the latter has been substituted as party plaintiff, and on or about May 1, 1957, the name of the party plaintiff was changed to Union Carbide Corporation. Defendant Lincoln is a manufacturer of equipment and supplies for electric arc welding, and defendant Graver is one of Lincoln's customers. The defense is being conducted on behalf of both defendants by defendant Lincoln.

2. The patent in suit, as originally issued, purported to cover an electric welding process, called submerged arc automatic welding, and various welding compositions or fluxes for use in that process. At the original trial of the case before the District Court, 19 claims of the patent in suit, including all of the process claims and two composition claims, were held invalid and void. Four claims of the patent, Nos. 18, 20, 22, and 23, which covered welding compositions, were held valid and infringed by the flux known as Lincolnweld 660, manufactured and sold by defendant Lincoln and used by both defendants. The District Court judgment was affirmed by the Supreme Court of the United States after extensive appellate proceedings including two hearings in the Supreme Court.

3. Following the final Supreme Court decision in 1950, the District Court entered a permanent injunction enjoining defendants from infringing the patent in suit. Shortly thereafter, plaintiff charged the defendants, and defendant Lincoln's president, J. F. Lincoln individually, with contempt of the Court's injunction by manufacture, sale, and use of the Lincoln welding fluxes generally referred to as the 700 series. The contempt proceeding arising from that charge occupied approximately two years and resulted in

a decision that the 700-series fluxes did not infringe plaintiff's patent, and that there had been no contempt of court.

4. This accounting proceeding was initiated by an order dated February 10, 1953. By the terms of that order, the Special Master is directed to ascertain and report the general damages due to plaintiff from defendants for the infringement, to make recommendations to the District Court as to whether such damages should be multiplied, to recommend what attorneys' fees, if any, should be allowed to plaintiff in connection with the infringement action, and to recommend what attorneys' fees, if any, should be allowed to defendants in connection with the contempt proceeding.

5. The performance achievements of the welding compositions covered by the four valid claims of plaintiff's patent in suit are described in the opinion and findings of the District Court dated June 6, 1947. The composition was put to wide practical use and greatly benefited American industry.

6. Companies using submerged arc welding with this composition realized substantial savings in cost and also they were able to increase the volume of production. The direct labor cost of submerged arc welding with this composition was as little as one-third or one-fifth the direct labor cost for comparable manual welding with coated rod. The handbook on welding issued by defendant Lincoln Electric Company showed how to compute costs of welding with coated rod and also how to compute costs of submerged arc welding employing the composition of the patent. The computations made as described in defendant's handbook showed a saving of 54 cents per pound of flux used in welding three-fourths inch plate.

7. Coated rod welding was the only electrical welding technique available in 1942 which produced welds of quality comparable with submerged arc welding employing the

composition of the patent. However, at the time infringement began in 1942 Lincoln had available to it fluxes it called 620 and 650 which it had used in automatic submerged arc welding in commercial production at the Graver plant in 1942 and each of which produced welds that passed x-ray tests and code requirements but neither of which produced as good results as those obtained by the use of the patented composition.

8. Several automatic welding processes were available in 1942 as alternatives to automatic submerged arc welding. Among these were carbon-arc automatic welding, bare-wire automatic welding, wire-and-tape automatic welding, automatic coated-electrode welding, and automatic inert-gas welding. All of these competitive processes were more economical than hand welding, in applications where automatic welding could be used, but none of them produced both the quality and speed of welding that resulted from the use of the patented composition in submerged arc welding.

9. Automatic submerged arc welding is most suitable for applications of a repetitive character, especially long horizontal seams. Coated rod hand welding has advantages on work where overhead or vertical welding is involved or where the work cannot be adapted to mechanization. Even today the greater amount of electric arc welding is done manually.

10. The speed and economy of automatic submerged arc welding are not solely attributable to the particular flux used, but are the joint achievement of the automatic submerged arc process itself, automatic welding heads specially designed for use with that process, and special work-handling machinery.

11. In its original form, plaintiff's patent in suit dominated the process of automatic submerged arc welding. All the claims in the patent covering that process were, how-

ever, held invalid and void, and were officially disclaimed from the patent by plaintiff. Thus plaintiff has at no time had any lawful patent monopoly over the process of automatic submerged arc welding.

12. The flux or welding composition used in automatic submerged arc welding is one of the factors which affect the results achieved. Depending on their particular physical and chemical characteristics, some fluxes are particularly adapted for welding heavy plate, other fluxes are adapted for welding thin plate at high speeds, other fluxes are particularly adapted for welding roundabout seams on pipe, tanks, etc., and still other fluxes are particularly designed for welding steels of special characteristics, such as stainless steel.

13. The fi[illegible]ctory use of submerged arc welding with the patented composition was made early in 1935 at the plant of Consolidated Steel Company in Los Angeles to try it out under actual factory conditions. Other factory installations were made shortly thereafter and in October, 1938, The Linde Air Products Company (a subsidiary of the present plaintiff) made public announcement at the Metals Show in Detroit of the patent involved as a patent covering process and also composition claims pertaining to automatic electric welding and called their patented composition "Unionmelt" and offered licenses to industrial companies on standard terms.

14. By September, 1942, 197 companies had signed license agreements and were using the patented composition in 299 plants and were paying royalties to plaintiff under such license agreements.

15. The Linde Company had a standard form of license agreement and the form in effect in 1942 when infringement began is attached to the Master's report as Appendix "H".

16. The licensee companies paid a single license fee under the license agreements and the fee was not allocated by the license agreements between process claims and composition claims of the patent in suit nor was any allocation made as to rights under other patents thereby granted. While there were minor variations in the wording of various forms of license agreements, the granting clause described the license in these words:

> "a non-exclusive, non-assignable license under all welding process claims contained in the Unionmelt Patent Rights, to use the Unionmelt Welding Process with steel electrodes or welding rods in the welding of steel products in and only in the licensed plants, and also a concurrent non-exclusive, non-assignable license under all welding composition claims contained in the Unionmelt Patent Rights, to use, but not to make, Unionmelt covered by such welding composition claims."

The licensee agreed to make a report and pay royalties within 30 days after the end of each quarter-yearly period. The licensor agreed to sell and deliver Unionmelt flux in quantities desired by the licensee. The royalty rate under the license agreements established in and prior to September, 1942, was 15 cents per pound of rod deposited for the first 50,000 pounds in any year and 10 cents on all additional pounds. The basis for measuring royalties by the amount of rod deposited was, as a practical business matter, a sound and convenient way of measuring the use of the process and composition claims of the patent for the purpose of paying royalties. Under all license agreements during the entire period between 1934 and 1949, royalties paid to the plaintiff by its licensees were at the rate of so many cents per pound of metal deposited in performing automatic submerged arc welding.

17. No one bought the patented composition from the Linde Company who had not signed a license agreement

of the type described in finding 16 above. There was no use for the composition except to provide submerged arc welding.

18. Because the first Supreme Court decision held the process claims of the patent invalid, the Linde Company found it necessary to terminate its license agreements on March 15, 1949, effective as of February 28, 1949. Up to that time about 1,100 companies had signed license agreements and paid royalties in the aggregate amount of $7,118,516.90. When the Linde Company terminated its license agreements effective as of February 28, 1949, it increased the price of the composition itself and included its royalty in the selling price of the composition.

19. Starting in 1935 the Linde Company made and sold Unionmelt welding composition of the grade known as Unionmelt 20. That was the calcium magnesium aluminum silicate with calcium fluoride added, the first satisfactory composition prepared and used by the inventors in 1932 in their experimental work leading to the invention in suit. Another composition prepared by the inventors was the manganese silicate with calcium fluoride added and they made welding tests with that composition and established that it would function in the same manner. That composition is substantially identical with Unionmelt 50 and Lincolnweld 660. The inventors did not, however, disclose in the valid claims of their patents that a composition consisting essentially of manganese silicate, without addition of other silicates, would function in accordance with the invention. The plaintiff as early as the Spring of 1939 did extensive development work with high manganese Unionmelts which were later marketed under the sales designations of Unionmelt 50 and Unionmelt 90. The first commercial sale of plaintiff's Unionmelt 90 was made in April, 1940, to the M. W. Kellogg Company. Plaintiff shipped $20.00 worth in 1940 and $5.00 worth in 1942. The next sales occurred in 1944 when $41,743.49

worth was shipped. The plaintiff also developed several other types of welding compositions and some of them were separately patented by plaintiff. In addition to its new compositions plaintiff developed specialized techniques and machines for utilizing automatic submerged arc welding in particular applications. The techniques and machines were in numerous instances separately patented. At the beginning all patents acquired by plaintiff on such fluxes, techniques and machines, were listed in its license agreements. In November, 1944, however, plaintiff dropped from the license agreements the patents dealing with equipment.

20. During the period of infringement the Lincolnweld 660 flux was used on heavy plate as well as thin plate but was better adapted to welding thin plate at high speeds. Unionmelt 20 was better adapted for welding heavy plate. Beginning in 1946 there developed a greater volume of welding done at high speeds for thin plate.

21. Maurice Taylor, an employee of the Lincoln Company, obtained samples of the Unionmelt composition in 1934 and 1935 and sent them to Lincoln's laboratory in Cleveland where they were analyzed. Lincoln's laboratory engineers prepared a simulation of the Unionmelt composition as early as July, 1935, and pursued their work with this composition over several months and gave demonstrations. During the latter part of 1935, Lincoln's laboratory engineers also conducted numerous experiments with submerged-arc welding using acid open hearth slag flux. Acid open hearth slag flux was, in 1935, already well known to Lincoln's engineers, having been used by Lincoln since 1932 prior to the application of Jones, *et al.*, for the patent in suit. Acid open hearth slag contains a substantial portion of manganese silicate, in combination with iron silicate and other mineral components.

22. The introduction of Unionmelt threatened to have substantial effect on the business of Lincoln Electric Com-

pany. With the first Unionmelt installation at the plant of Consolidated Steel Company in Los Angeles in 1935 the tests of Unionmelt were directly competitive with tests of Lincoln's "Tornado" carbon arc in the welding of a large pipe line. The Unionmelt welding produced very satisfactory results, while the carbon arc welding did not perform consistently.

23. Defendant Lincoln has manufactured and sold equipment and supplies for electric arc welding since about 1907. Lincoln's equipment and supplies for manual arc welding are extensively sold; its motor-generator sets, supplying the electric power necessary for ar: welding, are widely used and favorably known for good quality. Defendant Lincoln has had long experience in manufacturing automatic welding equipment, it having manufactured and sold equipment for carbon-arc automatic welding since 1926 or earlier. The Lincoln Company for many years has advertised itself as the "largest manufacturer of arc welding equipment in the world".

24. By 1942 defendant Lincoln had a large number of loyal customers throughout the United States, enjoyed widespread customer acceptance of its products, and had commercial entree to virtually all industrial plants having a use for electric arc welding. Specifically, defendant Graver, a tank manufacturer, was one of Lincoln's old customers which for years had used its products, including Lincoln's automatic carbon-arc welding equipment.

25. In building up its welding business, defendant Lincoln made numerous contributions to the art of electric arc welding. Among the specific Lincoln developments during the period prior to 1942 were various welding fluxes for use in automatic carbon-arc welding. One of these was a flux known as No. 420, made up predominantly of acid open-hearth slag, mixed with small proportions of fluorspar and silico-manganese.

26. In 1940 and 1941 Lincoln's laboratory engineers worked on projects to develop dual-arc welding sufficiently to make it competitive with Unionmelt welding. These efforts were not successful and in November 1941 Lincoln's laboratory engineers abandoned their work with dual-arc and switched over to the use of bare steel wire, as used in submerged arc welding. They proceeded to compound various fluxes and make welding tests and check the results against tests with the Unionmelt composition.

27. The Lincoln engineers carried on work at the Graver plant in 1942 in their efforts to develop a flux to compete with Unionmelt. They shipped an automatic welding head to the Graver plant together with a supply of Lincoln 620 welding flux which was similar to Lincoln 420 flux save for the addition of some silica to the formula. Experimental work with this welding head was carried on at Graver, by co-operation of the engineers of both companies, throughout the remainder of 1942. During the early portion of that period the 620 flux was used; later, some work was done with Lincoln 650 flux, a composition developed and patented by Lincoln and consisting of a mixture of manganese ore and silica, with minor parts of cryolite and silico-manganese. Both of these fluxes produced welds on commercial production when used in automatic submerged arc welding that passed x-ray tests and code requirements but neither of them produced as good results as those obtained by the use of the patented composition.

28. The Lincoln laboratory engineers on August 21, 1942, prepared a flux which was later designated as Lincolnweld 660, the flux adjudicated to be an infringement of the patent in suit. The flux was first shipped to the Graver company plant for testing on October 2, 1942. The 660 flux when tested at the Graver plants produced excellent results.

29. The defendants had the right to use the process of automatic submerged arc welding in their said testing

at the Graver plant and the Lincoln 620 and 650 fluxes did not infringe plaintiff's patented Unionmelt composition. The use of the Lincoln 620 and 650 fluxes in the testing at the Graver plant did not produce wholly satisfactory welding results while the Lincolnweld 660 flux produced excellent results. Lincoln at the time it introduced its 660 flux did not have any substitute or alternative fluxes which would produce welding results equal to those produced by the use of Lincolnweld 660 or Unionmelt.

30. In this accounting proceeding the Lincoln Electric Company sought and was given the opportunity of producing competent evidence of independent research and experimentation leading to the discovery of 660. Having heard the testimony of the witnesses upon examination and cross-examination and having studied the exhibits and witnessed the demonstration of welding operations given by defendants in the course of the trial, I find that the 660 flux was not the result of independent research or experimentation but was copied from the teachings of the patent.

31. The Lincoln Company shipped 215 pounds of the 660 flux to the Graver plant on October 2, 1942, and made welding tests with the 660 flux at the Graver plant commencing on October 5, 1942. During October, November and December, 1942, the Lincoln Company shipped the following quantities of the 660 flux to the Graver plant:

October 1942	3,222 pounds
November 1942	6,049 "
December 1942	8,624 "
Total	17,895 pounds

32. The plaintiff did not mark the number of the patent in suit on the bags of Unionmelt. At the time of the creation of the Lincolnweld 660 flux on August 21, 1942, the defendant Lincoln had actual knowledge of the existence of the patent in suit and its contents and that the plaintiff claimed its Unionmelt flux to be covered by the patent in suit and also had knowledge that its 660 flux might

infringe the patent in suit. At no time prior to the commencement of this action on October 1, 1945, did the plaintiff give either of the defendants any notice, either written or oral, that the Lincolnweld 660 flux infringed the patent in suit. Failure to give written notice of infringement to defendants was the result of a deliberate corporate policy on plaintiff's part, undertaken on advice of counsel.

33. Lincoln obtained an opinion of its counsel, John F. Oberlin, Esq., dated December 8, 1942. This opinion was obtained several weeks after the Lincoln Company adopted the 660 flux and started using it at the Graver plant, but before Lincoln embarked upon the general commercial manufacture and sale of the 660 flux. After careful study of the plaintiff's patents and the prior art, counsel advised Lincoln that plaintiff's asserted patent monopoly over the submerged arc automatic welding process was void, that the broad composition claims 24 and 26 of the patent were void, and that the 660 flux did not infringe the remaining claims of the patent. Counsel expressed the opinion that Lincoln 660 did not infringe the patent in suit because it was not an alkaline earth metal silicate flux and that the valid claims of the patent in suit encompassed only alkaline earth metal silicate fluxes. Lincoln 660 flux is a manganese silicate flux and is not an alkaline earth metal silicate flux. Counsel's advice to Lincoln with respect to the invalidity of plaintiff's asserted monopoly over the submerged arc automatic welding process and with respect to the invalidity of the broad composition claims 24 and 26 was correct and was sustained by the Courts. His advice with respect to the 660 flux proved to be in error by virtue of the Courts applying the doctrine of equivalents and holding the 660 flux did infringe claims 18, 20, 22 and 23 of the patent in suit.

34. The question of infringement was sufficiently doubtful that the Supreme Court granted a rehearing on that issue, and two justices dissented from the final judgment. Plaintiff considered the question whether a manganese sili-

cate flux was the equivalent of an alkaline earth metal silicate flux so doubtful that even after the District Court, the Court of Appeals, and the Supreme Court's first decision had held it was an equivalent, plaintiff nevertheless withheld payment of royalties to the inventors on the Unionmelt 50, a manganese silicate flux, until after the second decision of the Supreme Court.

35. The defendant Lincoln did not supply Mr. Oberlin with information as to the work done by the Lincoln engineers in creating and compounding the Lincoln 660 flux or the fact that the Lincoln 660 was not the result of independent research or experimentation but was copied from the teachings of the patent (Finding 30 herein). The opinion given by Mr. Oberlin was a good faith opinion of a competent and conscientious lawyer based on the facts he had before him and did not cover or anticipate the possibility of the Courts holding the 660 manganese silicate flux to infringe by virtue of being the equivalent of plaintiff's patent alkaline earth metal silicate flux. The Courts in adjudicating infringement in the herein matter under the doctrine of equivalents found that not only did the specifications of plaintiff's patent disclose manganese silicate to be a proper substitute for the alkaline earth metal silicates set forth in the claims of plaintiff's patent but also that there was an inference that the teachings of plaintiff's patent were the sole origin of the 660 flux due to the lack of evidence of independent research or experimentation by the defendant Lincoln. The findings of lack of evidence of independent research and the resulting inference that the 660 flux was copied from the teachings of plaintiff's patent were taken into consideration by the Courts in deciding to invoke the doctrine of equivalents. Had Lincoln disclosed to its counsel that the 660 flux was copied from the teachings of plaintiff's patent the opinion could, and probably would have, contained an admonition that a copyist was more likely to be found an infringer by the Courts than one infringing as a result of independent research.

36. The defendant Lincoln relied on the opinion of Mr. Oberlin that the plaintiff's composition claims were either void or not infringed by the Lincoln 660 by virtue of its being a manganese silicate flux and not an alkaline earth metal silicate flux in major proportion as encompassed by the claims that Mr. Oberlin considered to be valid and in so relying on said opinion thought lack of infringement by the Lincoln 660 would most likely be established by virtue of the Lincoln 660 being outside the scope of any valid claims of plaintiff's patent. The Courts found that the 660 did not literally infringe the valid composition claims of the patent. Prior to making its 660 flux, the defendant Lincoln had used acid open hearth slag in making welding fluxes. Acid open hearth slag is a fused material consisting principally of manganese silicate and iron silicate in approximately equal proportions. The defendant Lincoln had knowledge independent of plaintiff's patent that manganese silicate was a useful ingredient for welding fluxes. The plaintiff's patent as a whole, including its specifications as well as its claims, discloses that manganese silicate when used as a principal constituent of a welding composition prepared according to the teachings of the patent is a proper substitute for the silicates of the alkaline earth metals. The defendant Lincoln in making its 660 flux substituted manganese silicate for the alkaline earth metal silicates described in the claims of the patent; and with this substitution then proceeded to prepare the 660 flux in accordance with the teachings of the patent. By making the substitution disclosed in plaintiff's patent of an ingredient (manganese silicate) concerning which Lincoln had independent knowledge of its usefulness in welding fluxes and then proceeding to prepare the 660 flux in accordance with the teachings of the patent, Lincoln sought to stay outside the claims of the patent and to avoid literal infringement of the patent and hoped and thought it most likely, according to Mr. Oberlin's opinion, that in so doing the 660 flux would be found non-infringing. Lincoln did not disclose to its counsel that the 660 flux was not the result of wholly independent research but

was prepared from the teachings of the patent and Lincoln by making the substitution disclosed by the patent and then preparing the 660 flux in accordance with the teachings of the patent thought it most likely would avoid infringement, but nevertheless took a calculated risk that such a substitution might be held to be unimportant and insubstantial and result in infringement. Lincoln did not wholly rely in good faith upon the advice of counsel and took a chance on lack of infringement being established.

37. Prior to September 22, 1942, the royalty rate under the license agreements entered into by the plaintiff for its patent was 15 cents on the first 50,000 pounds of rod deposited in any year and 10 cents on additional poundage. For this royalty the licensee was granted among other rights the right to use the Unionmelt welding process described in the patent and also the right to use, but not to make, the Unionmelt composition described in the patent.

38. The aforesaid royalty rate was cut in half on September 22, 1942, on which date the plaintiff announced a reduction in the royalty rate to be effective as of the beginning of that quarterly period, that is July 1, 1942, to 7½ cents per pound on the first 50,000 pounds of rod deposited and 5 cents per pound on additional pounds. There had been no actual infringement by Lincoln at that date. On September 22, 1942, 660 flux had never been used outside the Lincoln laboratory and the plaintiff was not aware of its existence. Lincoln activities at Graver prior to September 22, 1942, had involved the performance of the submerged arc automatic welding process with non-infringing fluxes and had involved no infringement of plaintiff's patent. Plaintiff at that time contended that all process claims as well as all composition claims of its patent were valid and believed Lincoln to be infringing its patent at that time. Plaintiff reduced its royalty on that date partly because it wished to increase the extent of utilization of its patent in the war effort and increase the volume of business under its patent and partly because it thought its

competitor Lincoln was then infringing its patent and threatened to do so in the future. The amount or fraction of royalty reduction caused by plaintiff's fear of future infringement by its competitor Lincoln can not be fixed or determined from the evidence.

39. On April 19, 1943, the plaintiff announced a further reduction in its royalty rate, making it a straight 5 cents per pound of rod deposited, a rate which continued in effect until the license agreements were terminated in 1949. At this time Lincoln was actually infringing plaintiff's patent by the commercial manufacture and sale of its 660 flux and plaintiff also thought that Lincoln was infringing valid process claims in its patent. Plaintiff reduced its royalty rate to 5 cents per pound of rod deposited partly because it wished to increase the extent of the utilization of its patent in the war effort and increase the volume of business under its patent and partly because its competitor Lincoln was actually infringing its composition claims and the plaintiff thought Lincoln was infringing its process claims. The amount or fraction of royalty reduction caused by Lincoln's infringement and threat of future infringement can not be fixed and determined from the evidence.

40. Prior to June 23, 1943, the price base published by the Iron Age, to which plaintiff's flux prices were geared by its agreements with its licensees had changed. Accordingly, the price of plaintiff's flux was reduced, effective July 1, 1943, from 5 cents per pound to 4½ cents per pound.

41. A major factor contributing to the lower profit percentage on the plaintiff's Unionmelt business in the 1943-1950 period is the fact that the plaintiff in 1942 and early 1943 reduced by about 50 per cent the royalty rate specified in its license agreements. These reductions were motivated partly by defendants' activities but also by other reasons

42. On September 11, 1942, plaintiff wrote National Tube Company requesting it to reduce its royalty rate for

the Robinoff license in view of the proposed reductions the plaintiff was about to make in the Unionmelt royalty rate. This letter referred to the fact that the application of the Unionmelt welding process had increased tremendously and was playing a major role in the war effort and stated that the plaintiff was considering the advisability of reducing the royalty rate by 50% "in order that the process may be utilized to an even greater extent." This letter did not charge that the Lincoln Company was infringing the patent.

43. The reductions in the Unionmelt royalty rate on September 22, 1942, and April 9, 1943, and the reduction in the purchase price in the Unionmelt composition on June 23, 1943, were announced by form letters which the Linde Company sent to the Unionmelt licensees. These letters stated that the purpose of the reductions was to bring about the utilization of Unionmelt to the greatest possible extent and to encourage further expansion of the already widespread applications of the Unionmelt process in the war effort. These letters did not charge that the Lincoln Company was infringing the patent.

44. Congress, in 1942, had under consideration legislation authorizing government control of patent royalties and their reduction by government order whenever excessive. Such legislation was actually enacted on October 31, 1942. The pendency of this legislation was discussed in plaintiff's organization, and it was given some consideration in connection with the rate reduction.

45. The Lincoln Company produced 40,998,305 pounds of the 660 flux. The net sales thereof during the period of infringement, 1942-1950, totaled $4,353,777.12 and Lincoln's profit thereon before Federal income taxes was $940,275.60. More than 99% of all the 660 flux was sold to purchasers who were already customers of Lincoln for other products.

46. During the period of infringement, 1942-1950, Lincoln designed, made and sold numerous items of welding equipment, including welding heads, tractors, control mech-

anisms, generators and other items, all of which were especially adapted to be employed in submerged arc welding using the patented composition. The sales of such items by the Lincoln Company during the period of infringement aggregated $9,138,194.99 and the profit thereon before Federal income taxes was $1,393,042.39. The Lincoln Company also made sales of items of welding supplies and equipment, other than those included within the foregoing amount, and the estimated sales of such other items made by the Lincoln Company during the period of infringement to the same companies which purchased the 660 flux aggregated $99,194,605 and the estimated net profit therefrom was $15,228,416 before income taxes and $8,468,708 after income taxes.

47. Of Lincoln's total sales of rod and equipment usable in submerged arc welding during the infringing period, amounting to $9,138,194.99, a substantial portion, approximately $3,700,000, was from sale of welding generators in competition with others, but not in competition with plaintiff (which sold no generators) and approximately $2,800,000 was from sales of rod in competition with plaintiff and at least 18 other suppliers. Of the remaining sales of automatic welding equipment, approximately $800,000 was derived from the sale of squirt welders, a unique development of Lincoln, and the balance approximately $1,800,000 was of automatic welding equipment sold by Lincoln in competition with plaintiff, Westinghouse, Una, General Electric, and others.

48. In the period 1937 through 1942 the Linde Company was selling the patented composition to those who had accepted plaintiff's standard form of license. Linde's Unionmelt division business in that period also included sales of equipment, welding rod and other supplies. The period 1937 through 1942 is long enough to be representative of rates of earnings reasonably to be anticipated in the absence of infringement. Since that period includes the time of beginning a new venture as well as the onset of actual infringement the rates of earnings are actually on

the conservative side so far as evaluating the profitability of the welding composition is concerned.

49. In the period 1937 through 1942 the Linde Company had net income from sales and royalties for the entire Unionmelt division of its business of $9,416,775.29 of which $3,246,257.79 was income from sales of the patented composition and royalties. The net profit before payments to the inventors and of income taxes was $2,549,612.76 on the entire division business of which $1,639,861.55 was on sales of the composition and royalties. The ratio of profit to expense on the sales of composition and royalties portion of plaintiff's Unionmelt business was 102.083%. On the remaining portion it was only 17.293%, the ratio of profit to expense on the whole of plaintiff's Unionmelt division operations being 37.127%.

50. During the period 1943 to June 30, 1950, the ratio of profit to expense on the overall business of the Unionmelt division dropped to 20.744% from the 37.127% which had prevailed in the period 1937-1942. Computing the resultant loss on an overall basis for the division, and with expense of $29,423,295.44 during the period 1943 through June 30, 1950, they are $4,820,334.97. The principal decline, however, was in the ratio of profit to expense on the sales of the patented composition and royalties. On that portion of the business the decline was from 102.083% to 54.459%, while on the balance of the business the decline was from 17.293% to —0.118%. The computation of the losses in those two categories separately establishes a total computed loss suffered by the Linde Company of $8,521,234.10 for the period of the infringement, the years 1943 through June 30, 1950. Such computation, as shown on MP 67, is as follows:

	Sales of patented composition and royalties	Other Unionmelt operations	Total Unionmelt operations
Total profit would be	$11,481,737.63	$3,143,148.40	$14,624,886.03
Not the profit actually realized	6,125,274.80	loss(21,622.87)	6,103,651.93
Computed loss suffered	$ 5,356,462.83	$3,164,771.27	$ 8,521,234.10

By applying the 102.083% ratio of profit to expense on the sales of the patented composition and royalties of plaintiff during the 1937-1942 period to the sales by Lincoln of 40,452,169 pounds of infringing 660 flux during the years 1943 through June 30, 1950, the plaintiff, had it made all of said Lincoln 660 flux sales, would have made a profit of $1,734,794.03.

51. The ratio of profit to expense set forth in Findings 49 and 50 above for plaintiff's flux business between 1937 and 1942, treats all income received from royalties under the Unionmelt license agreements as if it were income from flux sales and this is not the fact. It ignores the fact that the plaintiff, when the royalties were paid, was illegally claiming a patent monopoly over the submerged arc welding process. Only a part of the royalty paid by the licensees was paid for the use of the patented flux (See also Finding 70).

52. The computations set forth in Findings 49 and 50 above assume that the decline in plaintiff's profit to expense ratio between the 1937-1942 period and the 1943 through June 30, 1950, period was the direct and sole result of the infringement on the part of Lincoln. This is not the fact. The decline came about for several reasons and partly because of a reduction in plaintiff's royalty rates and which rates were reduced partly because of Lincoln's infringement and partly for other reasons (See Findings 38 and 39).

53. The computations of the loss of profit to plaintiff through Lincoln sales of 40,452,169 pounds of 660 flux in Finding 50 above, assumes that the plaintiff would have sold all of said flux if Lincoln had not infringed. This is not the fact. A substantial part of such sales would have been made by plaintiff but not all of them. The exact part or portion is not ascertainable from the evidence.

54. In order to arrive at a fair evaluation of the income realized by plaintiff on the patented composition it is neces-

sary to add together income from sales of composition and income from royalties paid on the composition. Purchasers of the composition also paid royalties to the plaintiff on the composition and had to treat both as items of expense in using the composition. It is impossible to ascertain from the evidence the exact amount or fraction of the royalty payments that were paid for the use of the composition and what portion thereof were paid for other rights including process rights purportedly covered by the license agreements.

55. The license agreements included the Robinoff patent and several other patents in addition to the patent in suit in order to give licensees anything that might be helpful to them but the patent in suit was the dominant and main patent covered by the license and discussed in negotiations with licensees and prospective licensees. The royalty under the license however covered payment for all patents included in the license. The exact part or major fraction of the royalty paid for the patent in suit and the smaller part or fraction paid for the other patents can not be ascertained from the evidence.

56. The plaintiff received a notice of infringement from National Tube Company which held a patent issued in 1930 to that company as the assignee of Boris Robinoff, and as a matter of expediency, the plaintiff took a license in 1938 protecting its licensees against claims under the Robinoff patent and paid $665,234.45 thereunder to National Tube Company. Lincoln took a license under the Robinoff patent on May 18, 1945, and paid total royalties thereunder of about $25,000. The patent in suit was the only one of the patents listed in Unionmelt licenses that was of major importance and the Robinoff patent and other patents were listed to give the licensees assurance that they had freedom under all rights of the plaintiff in the field. While it is not possible to make an allocation of a definite part of the royalties to the patents other than the patent in suit they did constitute a small but significant part of the con-

sideration for the royalties paid. Apart from the patent in suit, the Robinoff patent was the most important of the patents covered by plaintiff's licenses.

57. The Linde Company paid over to the inventors a substantial portion of the income realized from the patent in suit. In determining the profit making potential of the patent, for purposes of evaluating what defendants wrongfully appropriated by their infringement, it is proper to consider the total of the income paid over to the inventors along with the portion retained as profit by the plaintiff.

58. In computing the damages which the plaintiff suffered as a result of the infringement, the plaintiff's profit to expense ratio, if ascertainable, for the pre-infringement period 1937-1942, can be used in helping to compute what the plaintiff's profit would have been during the period of infringement 1943-1950.

59. Near the end of the period of infringement, after adverse decisions of the Court of Appeals and the United States Supreme Court, the Lincoln engineers were able to develop and field test non-infringing fluxes and to substitute them commercially for the infringing 660, as follows:

> The 770 flux was first field tested in July, 1948, and was first shipped commercially in September, 1948. It was superseded by the 780 flux and shipments discontinued in July, 1949.
>
> The 780 flux was first field tested in February, 1949, and first shipped commercially in March, 1949. This flux was not for heavy plate.
>
> The 760 flux was first field tested in June, 1950, and first shipped commercially in June, 1950.

These fluxes are made from the same raw material as 660 and cost less than 660 to manufacture.

60. The Linde Company and the Lincoln Company were the only major producers of flux in the market for

submerged arc welding prior to and during the period of infringement. The evidence disclosed that the Una Company also produced welding fluxes but their chemical composition and the extent of their production and use is not disclosed by the evidence. The evidence does not disclose whether or not the Una Company's welding fluxes infringed plaintiff's patent, or whether or not they were successful when used in submerged arc welding. The Una Company fluxes were not satisfactory noninfringing fluxes that were available to the welding trade prior to and during the period of infringement.

61. The shrinkage in profit ratio on the plaintiff's Unionmelt operations during the period of infringement (as compared to the earlier 1937-1942 period) was due partly to Lincoln's infringement and partly to other reasons.

62. After Lincoln began selling the 660 flux it encountered some consumer resistance based on the fact that under certain welding operating conditions, welds made with 660 would have transverse, round-bottomed grooves and indentations in the surface of the weld called "cross-marks". Lincoln's laboratory devoted considerable time and effort to discovering the cause and cure for cross-marks and discovered in 1947 that by controlling the amount of lead, an ingredient not taught by the patent in suit, the occurrence of cross-marking was lessened. This discovery was patented by Lincoln. On April 30, 1947, Lincoln changed its manufacturing specifications to make certain there would be some lead in the 660 flux either by allowing it to remain in the basic ingredients or by adding small amounts of lead to the flux. Lincoln also discovered that cross-marking was affected not only by the amount of lead in its flux but also by the amount of current used in making the weld.

63. The Linde Company never intentionally added lead to any of its Unionmelt compositions at any time, but

rather sought to exclude lead, as an impurity from the finished product, because of possible deleterious effects in welding. It was not always possible to exclude lead, because the raw materials used in making Unionmelt compositions, like those used in making Lincolnweld 660 flux, contained lead as well as other impurities. After Lincoln had commenced adding lead to its 660 flux, plaintiff removed the ceiling on lead content which had previously been incorporated in its specifications for Unionmelt 50. After the removal of this ceiling, the lead content in Unionmelt 50 sometimes reached a level as great as in Lincoln's 660 flux.

64. Plaintiff in order to improve its Unionmelt welds caused its Unionmelt 50 after 1949 to contain an "ingredient X". This was done primarily to eliminate undercutting on thin plate welds. Plaintiff's "ingredient X" was not lead or any compound thereof. "Ingredient X" was not disclosed in the patent in suit and was not known to the inventors thereof. Plaintiff considered "ingredient X" to be a valuable trade secret, and, by permission of defendants, its identity was disclosed to the Master but not to defendants.

65. The controlling of the lead content of 660 flux by Lincoln tended to improve the marketability of 660 flux and made some contribution toward increasing its sales of 660 flux. It is impossible to determine from the evidence the amount of increase in sales of 660 flux that was attributable to the control of the 660 flux lead content.

66. The plaintiff, in the Unionmelt license agreements, gave the licensee the right to use the Unionmelt composition but expressly negatived any license to make the composition. The plaintiff made it clear to the Lincoln Electric Company, and to everyone else concerned, that it would yield the right to use the composition under the patent upon condition, and only upon condition, that the royalties were paid irrespective of who made the composition. Lincoln not only failed to pay plaintiff any royalties

for 660 flux supplied its customers, but also took active steps to discourage and prevent its customers from making such payments by denying infringement and necessity of paying license fees and offering indemnities.

67. The earliest form of plaintiff's license agreements required the licensee to use Unionmelt welding composition obtained from the plaintiff. About 1938 however, plaintiff discountinued the requirement that the welding composition be purchased from it and thereafter assured its licensees that they were free to purchase welding composition from any source they pleased provided they paid plaintiff the prescribed license fees based on the amount of rod deposited.

68. Out of a total of 40,998,305 pounds of Lincolnweld 660 flux it produced, Lincoln sold 10,728,455 pounds to companies who had a license from the plaintiff covering the patent in suit. Of this total, 2,177,255 pounds were sold prior to October 1, 1945; 2,408,100 pounds were sold after July 1, 1948; and the remainder, 6,143,100 pounds were sold between October 1, 1945 and July 1, 1948. One such company, Dravo Corporation, reported separately the pounds of rod it deposited through the use of Lincolnweld 660 flux and Dravo paid the plaintiff royalties thereon in the aggregate amount of $4,002.25 for rod deposited after commencement of suit on October 1, 1945, and Lincoln is entitled to credit for such payment in this accounting. Although there is evidence indicating license fees were paid to plaintiff on additional pounds of 660 flux sold by Lincoln to licensees of the plaintiff, it is impossible to determine from the evidence the amount of such additional pounds of 660 flux on which license fees were paid.

69. The defendant Lincoln Electric Company has failed to produce sufficient evidence to mitigate its liability by reason of the use of any Lincolnweld 660 for the United States Government or with its authorization or consent, except a total of 21,500 pounds sold to the United States Navy, of which 5,400 pounds were sold after the filing of

the complaint and for which the defendant Lincoln is entitled to credit in this accounting.

70. There was, before Lincoln entered the field, an established royalty rate under plaintiff's license agreements for the use of the process and composition claims of the patent in suit and the other patents listed in plaintiff's licenses which had been accepted widely enough in industry to indicate a general acquiescence in its reasonableness, and which was 15 cents on the first 50,000 pounds of rod deposited in any year and 10 cents on additional poundage. The process claims of the patent in suit however, were held invalid and it is impossible to determine from the evidence the part or portion of the above royalty paid under plaintiff's said license agreements that is allocatable to the four composition claims that were held valid and infringed by the defendant Lincoln. There was therefore no established royalty rate for the use of the four composition claims that were held valid and infringed by the defendant Lincoln.

71. The expression "rod-melt ratio" as used with reference to submerged arc welding applications, means a ratio of the amount of rod consumed to the amount of flux consumed. This ratio will vary in particular welding applications depending on various factors but the evidence establishes an over-all ratio of 1 pound of rod deposited for 1 pound of flux consumed for both the Unionmelt and the Lincolnweld 660 flux. The evidence further establishes that a substantial amount of the flux that was manufactured and sold by both the plaintiff and the defendant Lincoln was wasted or lost and not actually used in depositing rod in a welding process. The over-all ratio of flux manufactured and sold to rod deposited was 1.5 pounds of flux manufactured and sold for every 1 pound of rod deposited.

72. Applying the reasonable royalty method of computing damages to the evidence and to the findings of fact herein set forth and with due consideration of the evidence

and the findings herein concerning plaintiff's loss of sales of flux and loss of profits on sales of flux and welding equipment and supplies during the infringement period resulting from Lincoln's infringing activities, the minimum royalty that the plaintiff should be willing to accept and the defendants should be willing to pay for the right to make, use and sell the patented composition and being a reasonable royalty, was the sum of 5 cents per pound of rod deposited.

73. A total of 40,998,305 pounds of 660 flux was manufactured and sold by Lincoln. Of that total 4,616,529 pounds were manufactured and sold by Lincoln prior to October 1, 1945, the date of commencement of this action, leaving 36,381,776 pounds manufactured and sold by Lincoln after the commencement of the suit on October 1, 1945. The defendant Lincoln is entitled to a credit of 5,400 pounds against this latter figure, leaving it chargeable with 36,376,376 pounds (Finding 69 above). Applying the over-all ratio of flux manufactured and sold to rod deposited (Finding 71 above) of 1.5 pounds of flux manufactured and sold for every pound of rod deposited, the reasonable royalty of 5 cents per pound of rod deposited is equivalent to 3⅓ cents per pound of flux manufactured and sold by Lincoln. 36,376,376 pounds of flux manufactured and sold by and chargeable to Lincoln after the filing of suit on October 1, 1945, results in a total reasonable royalty of $1,212,545.86 (36,376,376 pounds times 3⅓ cents).

74. The defendant Graver bought a total of 629,000 pounds of 660 flux after October 1, 1945, the date of commencement of this action. Applying the over-all ratio of flux manufactured and sold to rod deposited (Finding 71 above) of 1.5 pounds of flux manufactured and sold for every pound of rod deposited, the reasonable royalty of 5 cents per pound of rod deposited is equivalent to 3⅓ cents per pound of flux manufactured and sold to Graver. The 629,000 pounds of flux manufactured and sold to Graver after the filing of suit on October 1, 1945, results in a total reasonable royalty of $20,966.66 (629,000 pounds times 3⅓ cents).

75. Lincoln Electric Company carried on a vigorous campaign against the Linde Company's Unionmelt licensing program. Although the 660 flux constituted only about 3% of the sales volume of the Lincoln Company, its sales representatives devoted as much as 19% or more of their time in the promotional campaign for the 660 flux. Sales representatives of Lincoln Electric Company, under instructions from the home office and the district offices, told Unionmelt licensees and prospective licensees that they need not pay royalties for the use of the 660 flux and that Lincoln would indemnify them and fight their battle for them. This campaign intentionally interfered with the Linde Company's licensing program and the payment of royalties by the licensees.

76. The Lincoln Company gave indemnities to its customers against infringement liability which might result from the practice of submerged arc automatic welding and the use therein of 660 flux. This was done as part of a campaign by Lincoln to discourage and prevent payment of royalties to plaintiff under the patent in suit and at a time that Lincoln was not relying wholly in good faith on the opinion of counsel that Lincoln 660 did not infringe (See Finding 36).

77. The Lincoln Company greatly increased its production of the 660 flux after obtaining the supersedeas from the District Court in July, 1947. The highest rate of production for the 660 flux was during the months immediately preceding the second decision of the Supreme Court handed down May 29, 1950, and the three weeks elapsing between that decision and the issue of the permanent injunction.

78. Lincoln, when it engaged in infringing activities by the making and selling of the Lincolnweld 660 flux, because it had copied the same from the teachings of the patent in suit, did not act in wholly good faith belief that it was acting within its legal rights as to the 660 flux and took a chance on lack of infringement being established and a

calculated risk that its Lincoln 660 flux would be found not to infringe.

79. The plaintiff incurred and paid attorneys' fees and other litigation expenses in the proceeding leading to the Interlocutory Decree dated July 9, 1947, in the amount of $687,226.17. These expenses were wholly incurred in connection with the proceedings before Judge Swygert leading to the Interlocutory Decree dated July 9, 1947, and with the subsequent appellate proceedings in the United States Court of Appeals and the United States Supreme Court in review of that decree. A reasonable fee for the services rendered by plaintiff's attorneys in the proceeding leading to the Interlocutory Decree in the herein matter dated July 9, 1947, is the sum of $500,000.

80. The defendant Lincoln incurred and paid attorneys' fees and other litigation expenses in the defense of plaintiff's Motion to Adjudge Defendants in Contempt of Court in the amount of $202,706.43. A reasonable fee for the services rendered by the attorneys for the defendant, The Lincoln Electric Company, in defense of plaintiff's Motion to Adjudge Defendants in Contempt of Court is the sum of $180,000.00.

VII. Conclusions of Law.

1. This Court has jurisdiction of the parties hereto and of the subject matter of this cause.

2. There was no established royalty applicable to the welding composition covered by the four valid claims of the patent in suit.

3. Plaintiff has been unable to and therefore has failed to prove with sufficient accuracy for judicial determination the following:

(a) The amount of its damage from loss of profits it would have made on such additional sales of the patented composition it would have made but for the infringement.

(b) The amount of its damage from loss of additional profit on its sales which would have resulted from higher prices it could, and, but for the infringement, would have charged for the patented composition sold by plaintiff.

4. The defendants are not liable to the plaintiff with respect to 660 flux manufactured and sold or used prior to October 1, 1945, the date of commencement of this action.

5. The plaintiff is entitled to recover from the defendant, The Lincoln Electric Company, as damages, a reasonable royalty in the amount of $1,212,545.86 less a credit of $4,002.25 for license fees paid by Dravo Corporation to plaintiff in connection with the use of Lincoln 660 flux, or the sum of $1,208,543.61. Of the last stated amount the defendant, Graver Tank & Mfg. Co., Inc., is jointly liable with the defendant, The Lincoln Electric Company, to the plaintiff in the sum of $20,966.66.

6. The defendant, The Lincoln Electric Company, is not entitled to any credit by reason of sales of the Lincolnweld 660 flux to companies which signed Unionmelt license agreements with the plaintiff or by reason of payments made by such companies to the plaintiff, except for the sum of $4,002.25 paid by Dravo Corporation and which has been taken into consideration in Conclusion 5 above.

7. None of the sales of Lincolnweld 660 flux are exempt from this accounting by virtue of Title 28 U. S. C. 1498, or any other applicable law, except 5,400 pounds sold to the United States Navy.

8. It is recommended that an award of damages be made against the defendant, The Lincoln Electric Company, and the defendant, Graver Tank & Mfg. Co., Inc., jointly, and in the amount of $20,966.66 and that an award of damages

be made against the defendant, The Lincoln Electric Company, alone, in the amount of $1,187,576.95 and all as set forth in Conclusion 5 above, and that each award bear interest at the rate of 6% per annum from the date of the filing of the Master's Report in the herein proceedings.

9. Based on the evidence and the facts set forth in the above findings, I recommend that the award of damages assessed against the defendant, The Lincoln Electric Company, be increased by adding to the sum recommended in Conclusion 8 above, the additional sum of $600,000 as purely compensatory damages to cover the inconvenience, trouble and expense which the plaintiff has suffered by reason of the infringement and based on the fact that the plaintiff has been compelled to conduct long and expensive litigation and which the plaintiff should recover as reimbursement for what it has actually suffered and that the additional sum awarded to the plaintiff under the paragraph bear interest at the rate of 6% per annum from the date of the filing of the Master's Report in the herein proceedings.

10. The fact that the plaintiff has been compelled to conduct long and expensive litigation was taken into consideration in Conclusion 9 above and I recommend that no allowance be made to plaintiff for attorneys' fees in the proceeding leading to the Interlocutory Decree dated July 9, 1947.

11. I recommend that no allowance be made to the defendant, The Lincoln Electric Company, for attorneys' fees in defense of plaintiff's Motion to Adjudge Defendants in Contempt of Court.

12. I recommend that final judgment be entered in favor of the plaintiff and against the defendants, The Lincoln Electric Company and Graver Tank & Mfg. Co., Inc., jointly, in the amount of $20,966.66 and against the defendant, The Lincoln Electric Company, alone, in the amount of $1,187,576.95, together with interest from the date of the filing of the Master's Report in the herein proceedings, as provided in Conclusions 5 and 8 above; together with judg-

ment against the defendant, The Lincoln Electric Company, alone, for the additional sum of $600,000 with interest thereon from the date of the filing of the Master's Report in the herein proceedings as provided in Conclusion 9 above.

NOTE.

In an Order entered by you as District Judge in the herein matter and dated November 25, 1953 (see Appendix "D" attached hereto) and made in connection with a Motion by the defendants to strike out Paragraph 4 of the Master's Order of June 20, 1953, the following request was made of the Master:

"It is suggested to the Master that if consideration is given to any evidence submitted covering the schedules called for in subparagraphs (c) and (d) of his Order in a determination of a reasonable royalty, he attempt to indicate what weight he attaches to such evidence".

The subparagraphs (c) and (d) above referred to were contained in the "Order of Master to Defendants to Appear and File Statements of Account" and dated June 20, 1953 (see Appendix "C" attached hereto) and read as follows:

> (c) A schedule setting forth the gross sales and net profits thereon for all welding rod, automatic or manual welding heads, controls, generators, and any other supplies, equipment, and machines, represented by Lincoln to be useful in welding with its 660 flux or usable in conjunction therewith and sold during the same period in which Lincolnweld 660 flux was sold by Lincoln.
>
> (d) A schedule setting forth the gross sales and net profits thereon of defendant, Lincoln, on all sales by it of welding supplies, equipment and machines (other than those covered in subparagraph (c) above) sold by Lincoln to purchasers from it of Lincolnweld 660 flux, together with all service charges received by Lincoln from such purchasers, during the same period in which Lincoln sold Lincolnweld 660 flux.

At the trial and hearing before the Master evidence was submitted and admitted covering the schedules called for in said subparagraph (c) and (d).

In my determination of a reasonable royalty as set forth in the herein findings and conclusions of law I did give consideration to the evidence submitted covering the schedules called for in said subparagraphs (c) and (d) and the findings based thereon. I have not found the defendants liable in damages for contributory infringement with items other than the patented composition. I have not and am not able to allocate any exact dollar and cents portion of the 3⅓ cents per pound of reasonable royalty I have determined, to the sales of Lincoln welding supplies, equipment and machines. In determining reasonable royalty I did however, take into consideration the fact that Lincoln did sell welding supplies, equipment and machines usable both with and independent of its 660 flux and the extent of such sales and the profit it made from such operations in arriving at a reasonable royalty for the 660 flux which resulted in a total dollar amount that exceeds the actual profit Lincoln made on its sales of 660 flux during infringement and prior to payment of Federal income taxes.

The fact that Lincoln had such sales of supplies, equipment and machines and the extent thereof and the profit therefrom was given weight by me in arriving at the conclusion that in the hypothetical negotiation of a reasonable royalty the parties would have taken such facts into consideration and that Lincoln as a proposed licensee would be willing, if thought necessary and desirable, to charge part or all of the royalty agreed upon to other operations rather than include the royalty in the selling price of its 660 flux.

Respectfully submitted,

Henry R. Sackett,
Special Master.

Dated at Gary, Indiana, May 16, 1958.

THE UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF INDIANA,
HAMMOND DIVISION.

UNION CARBIDE CORPORATION,
vs.
GRAVER TANK & MFG. CO., INC. and
THE LINCOLN ELECTRIC COMPANY.

No. 607 Civil.

Opinion on Defendants' Objections to the Special Master's Report and Plaintiff's Application Thereon.

The Master made eighty separate findings of fact of which defendants object to thirty-one. Objection is made also to four of his conclusions of law. Plaintiff does not object to the findings of fact, but asks that certain conclusions of law be modified. Some of these matters will be treated together.

I. FINDINGS 6, 7, 8, 27 AND 29.

Defendants claim that Findings 6, 7, 8, 27 and 29 confuse submerged arc welding process with the valid flux composition claims of the patent, and overstate the advantages of submerged arc welding employing the patented flux as compared with available alternative noninfringing fluxes. Without going into multitudinous detail, I think the record supports the Master's findings. The fact that Lincoln, being dissatisfied with the 620 and 650 fluxes, continued to experiment until it had compounded the infringing flux belies its claim that the noninfringing fluxes were as good as either the patented or the infringing flux.

II. FINDINGS 72, 73 AND 74; CONCLUSION OF LAW 5.

Defendants contend that the Master erred in recommending an award of damages based upon a reasonable royalty of 5 cents per pound of rod deposited for the 660 flux manufactured and sold by Lincoln in the aggregate sum of $1,208,543.61. On the other hand plaintiff contends that the Master's recommended award is inadequate to compensate it for the infringement. These contentions will be treated together.

Plaintiff does not quarrel with the Master's determination that a reasonable royalty is 5 cents per pound of rod deposited. It says, however, that a reasonable royalty is the minimum for any award and that the facts found by the Master require an increase of damages over the recommended amount in order that it be adequately compensated for the infringement of its patent.

Defendants ask the Court to substitute other findings for the Master's Findings 72, 73 and 74 and to determine particularly that a reasonable royalty for a license to make, use, and sell the 660 flux during the period between October, 1942 and June, 1948, would have been 2½% of the selling price of the flux, and for the period between July 1, 1948 and June, 1950, 1% of the selling price of the flux.

Defendants contend that the Master erroneously confused the patented flux with the void process claims of the patent, thereby placing his determination of a reasonable royalty upon a broader base than was justified. The Master's Findings, particularly 16, 54 and 70, afford ample proof that he had in mind the fact that the process claims were void and that a reasonable royalty could only be established on the patented composition. In Finding 70 he observed:

> ". . . it is impossible to determine from the evidence the part or portion of the above royalty paid under plaintiff's said license agreements that is allocatable to the four composition claims that were held valid and infringed by the defendant Lincoln. There was therefore no established royalty rate for the use of

> the four composition claims that were held valid and infringed by the defendant Lincoln."

When this is considered, along with the fact that from April 19, 1943 until the license agreements were terminated in 1949, plaintiff's charge for the flux was 5 cents per pound of rod deposited, defendants' contention is without merit.

The defendants contend also that in fixing a reasonable royalty, the Master did not consider the available alternative noninfringing fluxes. In support of their position they cite *Columbia Wire Co.* v. *Kokomo Steel & Wire Co.*, (C. C. A. 7, 1911) 194 Fed. 108. I think this case states the law as to the effect to be given to noninfringing articles available to the public which may be used as alternatives for the patented article. It should be noted, however, that the opinion in this case contains the following sentence: "the only actual advantage of the patented machine is its *superiority,* if any, over these later machines that are not dominated by the patent." (Emphasis supplied). Ibid, p. 110.

The difficulty with defendants' position is that until Lincoln developed the 700-series of fluxes there were no noninfringing fluxes available that were as good in performance as the patented composition. The Master's finding that "... the use of Lincoln 620 and 650 fluxes at the Graver plant did not produce wholly satisfactory welding results while the Lincolnweld 660 flux produced excellent results" is supported by the evidence. As for the 700-series fluxes, the answer to defendants' argument is that even though Lincoln developed this noninfringing flux in 1948, it continued to produce and sell the infringing flux until the issuance of the Supreme Court's mandate in June, 1950.

Defendants' next attack on these particular findings and conclusion of law relates to the Master's alleged error in giving weight to the fact that Lincoln during the infringing period sold special equipment for use in submerged arc welding and also other items of welding supplies and equipment during the period. In my opinion this is a legitimate consideration in determining an adequate compensatory award of damages. On this point I adhere to the views expressed in the memorandum decision dated November 25, 1953.

Defendants contend next that the Master erroneously considered the total payments made by plaintiff to the inventors, and that he should have only considered the sums paid them attributable to the valid composition claims of the patent. The Master stated in his Finding 57:

> "In determining the profit making potential of the patent, for purposes of evaluating what defendants wrongfully appropriated by their infringement, it is proper to consider the total of the income paid over to the inventors along with the portion retained as profit by the plaintiff."

Nowhere does the Master indicate that he used this Finding in fixing a reasonable royalty; but even if he did, it does not mean that he did not have in mind that the process claims were invalid.

Finally defendants say that the Master in weighing the evidence on the question of a reasonable royalty erred in not fixing an award much lower than the one he recommended. In that regard they say in their brief:

> "A fair award of reasonable royalty, as damages for the infringement here involved, lies in the neighborhood of 5% or less for the period prior to the 700-series fluxes and in the neighborhood of 1% for the period after the 700-series fluxes came into being."

Unless it can be determined that the Master's finding in fixing a reasonable royalty at 5 cents per pound of rod deposited is clearly erroneous, Rule 52(a) of the Federal Rules of Civil Procedure prevents the setting aside of the finding. The Master heard a lengthy trial. He also had the benefit of extensive briefs and arguments. Although these factors, themselves, do not insure against error they do support the view that the issue in regard to the amount of a reasonable royalty was presented before the Master in a manner to afford full and deliberate consideration of the evidence. The evidence, as well as the Master's related findings of fact, sustain the conclusion that on this point the Master was not in error.

Plaintiff says that the Master should not have limited his award to a reasonable royalty of 5 cents per pound of rod deposited, not only because Lincoln gained more than the award, but also for the reason that plaintiff lost far more than the recommended amount of damages. Plaintiff says also that the Master erroneously interpreted the Court's decision as to the patent's process claims and that he erred in disallowing interest.

The Master found that Lincoln's profit before federal income taxes on the sale of 660 flux was $940,275.60 and on its sale of welding heads and other equipment and materials especially adopted in using the patented flux, $1,393,042.39. In my opinion both profits are legitimate factors in determining an adequate award of damages for the infringement of the patent. The sales of 660 flux and special equipment not only gave Lincoln a profit in excess of $2,000,000, but the development of the infringing flux helped Lincoln maintain its prominence in the welding equipment and supply field. It should be noted that the Master stated that in fixing a reasonable royalty, he gave weight to the amount of Lincoln's sales of special welding equipment and materials adopted for using the patented flux.

As to what plaintiff lost because of the infringement, I think the Master was correct in attempting to use the profit-to-expense ratio in computing the loss. It seems a logical and practical way, particularly if a sufficient period of time before the infringement is considered. I agree with the Master's statement that, "The period 1937 through 1942 is long enough to be representative of rates of earnings reasonably to be anticipated in the absence of infringement."

The Master found that the profit-to-expense ratio was 102.083 per cent. Using this figure, he computed the loss suffered by plaintiff from its sales of the patented flux and its royalties during the infringement period at $5,356,462.83 and from its other Unionmelt division business at $3,164,771.27, a total of $8,521,234.10.

After much deliberation I have decided that, although what plaintiff lost is a proper consideration in determining damages, the Master was not in error in rejecting the computed losses as a measurement.

The Master pointed out in Finding 51 that these computations treated income received from royalties as if it were from the flux sales alone. He indicates, however, that this is not the fact because the royalties covered not only the flux claims but also the invalid process claims. In Finding 70 the Master states, ". . . it is impossible to determine from the evidence the part or portion of the . . . royalty paid under plaintiff's said license agreements that is allocatable to the four composition claims that were held valid and infringed by the defendant Lincoln."

The Master also points out that the computations are based on the assumption that the decline in plaintiff's profits-to-expense ratio after 1943 was due solely to Lincoln's infringement. He indicates that this also is not the fact because the reduction in plaintiff's royalty rates was due to causes other than the infringement. After reciting the facts relating to plaintiff's several reductions in its royalty rates beginning September 22, 1942, the Master concluded by saying, "The amount or fraction of royalty reduction caused by Lincoln's infringement . . . can not be fixed or determined from the evidence."

The Master determined that plaintiff had failed to prove with sufficient accuracy:

> (a) The amount of its damage from loss of profits it would have made on additional sales of the patented flux had there been no infringement.
>
> (b) The amount of its damage from loss of additional profit on sales resulting from higher royalty rates and prices it could have charged except for the infringement.

This conclusion necessarily follows from the findings upon which it is based. Although plaintiff has objected to the conclusion, it has not objected to the findings.

Regardless, however, of plaintiff's acquiescence in the Master's determination of the facts, I think the Master properly rejected the profits-to-expense ratio method in this case in recommending the amount of damages. The license agreements included a royalty on both the process and the composition claims of the patent. What plaintiff would have charged as a royalty on the composition claims alone from the starting period of infringement to February 28, 1949 is purely a matter of speculation.

It is true, as plaintiff says, that there was only a single invention, but it does not follow that the Master erred in concluding that it is impossible accurately to measure damages by the profit-to-expense ratio method. That method would require an allocation of royalty payments between process and composition claims. The scope of the invention is measured by what has been determined by the Court, not by the claims granted by the Patent Office. Since the invention is now limited to four composition claims, plaintiff's royalty payments based on the invalid process claims cannot be included in a proper base for determining the amount plaintiff lost by reason of the infringement. Principally for this reason, I have concluded that plaintiff's contention that its damages should in large measure be determined by what it lost from the infringement, cannot be sustained.

III. Findings of Fact 66 and 67; Conclusion of Law 6.

In his Conclusion 6 the Master determined that Lincoln is not entitled to any credit by reason of sales of 660 flux to plaintiff's licensees except for $4,002.25 for license fees paid by Dravo Corporation to plaintiff. He deducted this amount from the award of damages for infringement. This conclusion is based on Findings 66, 67 and 68. The defendants object to the concluding part of Finding 66, which recites that "plaintiff made it clear to the Lincoln Electric Company, and to everyone else concerned, that it would yield the right to use the composition under the patent upon condition, and only upon condition, that the royalties were paid irrespective of who made the composition."

In Finding 68 the Master stated that, "Although there is evidence indicating license fees were paid to plaintiff on additional pounds of 660 flux sold by Lincoln to licensees of the plaintiff, [the exception, that sold to Dravo Corporation] it is impossible to determine from the evidence the amount of such additional pounds of 660 flux on which license fees were paid."

It is conceded by plaintiff that all 660 flux on which a Linde license paid a royalty should be excluded from the accounting. In other words, it admits that it is not entitled to be paid twice. On that issue defendants had the burden of proof. Except for the sales to Dravo Corporation, there was a failure of proof.

Defendants contend, however, that despite the failure on their part to furnish proof of payment by plaintiff's licensees to it of royalties covering sales to them of 660 flux other than that sold to Dravo, Lincoln is entitled to full credit for all such sales. Their theory follows this line of argument: Plaintiff stipulated with licensees that although they could not make the patented flux, the license contract provided they might use it or any other flux. The right to use the flux carried with it the right to manufacture or to have it manufactured. Consequently, when Lincoln manufactured the 660 flux and sold it to the licensees, there was no invasion of plaintiff's rights because it did nothing more than what the licensees had a right themselves to do. Along with this contention the defendants quarrel with the Master's finding that the license grant of the right to use the patented flux was only the condition that royalties be paid irrespective of who made the composition.

The Master's construction of the license contract is correct in my opinion. The promise to pay royalties was the *quid pro quo* for the right granted by the licensor to use the composition.

Furthermore defendants' main contention is untenable. While it is true the plaintiff might have chosen to sue its licensees for royalty payments for all 660 flux they purchased from Lincoln, this was not the only relief available to it. Plaintiff also had the choice of suing Lincoln for infringement.

Plaintiff had a choice of remedies but that choice did not imply a requirement to adopt the one that would relieve Lincoln from liability.

The license provision for the right to use but not to make the patented flux would under some circumstances imply a right in the licensee to make or have made for it the flux composition. For example, if the plaintiff could or would not supply the flux, such implied right might be utilized. Moreover, from plaintiff's representation that licensees might use flux composition from any source they pleased, provided the license fees were paid, two implications arose: (1) the possibility that plaintiff might license others to manufacture and sell the patented flux, (2) if infringing fluxes were used, plaintiff would nevertheless be protected in that it reserved the choice of collecting its royalty either from the licensee or the infringer.

Lincoln, of course was not a licensee. Furthermore, the licensees who purchased 660 flux did not commission Lincoln to make the flux for them. Finally, there was no occasion for such substitution purchases of flux because there is no showing that plaintiff at any time refused to sell or furnish Unionmelt to its licensees.

IV. OTHER FINDINGS OF FACT.

The defendants object to that part of Findings 38, 39 and 41 which allude to plaintiff's fear of Lincoln's infringement as well as the actual infringement as some of the reasons for plaintiff's lower reduction in the royalty rates under the license agreements and for plaintiff's lower profit percentage during the infringement period. There is an evidentiary basis for these findings and I do not think the Master was clearly erroneous in making them.

The defendants also object to Findings 48, 54, 57, 58 and 61. Some of these findings have been treated in the foregoing determinations of the Court. Aside from that I have concluded that the Master was not in error in making these findings.

V. Findings 30, 35, 36, 75, 77; Conclusion of Law 9.

The Master in his Conclusion 9 recommended additional damages in the sum of $600,000. Plaintiff contends that the sum is inadequate and asks that the amount be increased to $2,000,000. Defendants, on the other hand, contend that the Master should not have recommended any increase in damages. The latter contention is based on certain "factual inferences" which defendants say the Master erroneously made.

Defendants' specific contentions are stated in their objections to the Master's Report as follows:

> "1. Three of the factual inferences underlying the award of additional damages are clearly erroneous:
>
> (a) The Master's inference, expressed in Findings 30, 35, 36, and 78, that Lincoln obtained the 660 flux by copying the teachings of the patent is wholly unsupported by evidence, is disproved by the patent itself, and is inconsistent with the Master's finding (Finding 36) that Lincoln had longstanding knowledge, independent of the patent, of the value of manganese silicate as a fluxing material.
>
> (b) The Master's inference, expressed in Findings 35, 36, and 78, that Lincoln did not wholly rely in good faith on the opinion of its counsel that 660 did not infringe is unsupported by evidence and is inconsistent with specific fact findings of the Master, to-wit: * * *
>
> (c) The inference (Finding 77) that 660 production was stepped up in 1950 to 'beat the gun' on the impending injunction is not true."

Under item "(a)" defendants maintain that it would be impossible to copy the 660 flux from the patent. Rephrased, this argument says simply that there could not have been an infringement by developing the 660 flux. By making this contention defendants attempt to obtain a redetermination of the issues of infringement.

Defendants also contend that even if copying were possible, Lincoln did not really copy; rather it developed the 660 flux from its own independent research and development. The Master found otherwise. I do not think he erred. Although Lincoln knew, independent of the patent, that manganese silicate was a useful ingredient for welding fluxes, it would appear from the evidence that it did not know except for the patent how to prepare a flux using manganese silicate so that it was an equivalent of the patented composition. Lincoln obtained samples of the patented flux as early as 1934 and 1935. From that time on it attempted, unsuccessfully, to simulate plaintiff's product until August 21, 1942, when, except for the substitution of manganese for magnesium, the same ingredients as specified in the patent were used to form a silicate by prefusion according to the teachings of the patent. During this period of experimentation Lincoln of course was aware of possible infringement; otherwise it would not have sought its patent counsel's advice about that possibility. I am convinced that the evidence heard by the Master shows that he was correct in holding that Lincoln developed 660 flux by copying the teachings of the patent.

I am convinced also that the Master was correct in finding that Lincoln did not furnish its patent attorney with information relating to the work done by its engineers in developing 660 flux and that its flux was not the result of independent research and experimentation. Defendants had the burden of persuasion on the issue of reliance in good faith upon the advice of counsel. Reliance upon counsel's advice as a defense must be based upon a full disclosure of the facts. In my opinion, Lincoln's failure to disclose completely to Mr. Oberlin its laboratory experimentation with Unionmelt samples precludes a holding that its development of the 660 flux was in good-faith reliance upon its counsel's advice.

I think the Master's findings in regard to Lincoln's "vigorous campaign against the Linde Company's Unionmelt licensing program" (Finding 75), the fact that Lincoln promised to indemnify its customers against infringement liability (Finding 76), and that it increased production of 660 flux during the months and weeks immediately preceding the issuance of the permanent injunction (Finding 77) are not material to the question of increased damages. Therefore the question whether they are clearly erroneous need not be discussed.

In *Activated Sludge, Inc.* v. *Sanitary District of Chicago,* 64 F. Supp. 25, the court stated with regard to the allowance of extra damages:

> "As to that, I conclude that the extra damages recoverable thereunder may be punitive if the circumstances so warrant, but include also damages purely compensatory which are elusive but which plaintiffs ought to recover, not as punishment but as reimbursement for what plaintiffs have actually lost. Consequently I have carefully avoided any allowance in the nature of exemplary damages and have included only compensatory damages. In this connection I have not given weight to the amount of fees of counsel but have considered the fact that the plaintiffs have been compelled to sustain long and expensive litigation." (Ibid, p. 36).

The long and expensive litigation in the present case is a factor that should be considered. The evidence indicates that from 1945 to and including 1950 plaintiff's expenses covering this controversy amounted to $687,226.17.

Although the Master, as heretofore mentioned, gave weight to the amount of sales of special welding equipment using the patented flux in his determination of a reasonable royalty, I think consideration should be given to what Lincoln gained in other ways by its infringement, namely, (1) its profit on the sale of 660 flux and (2) the maintenance of its standing among manufacturers of welding equipment and supplies. In the *Activated Sludge* case Judge Lindley indicated that extra damages may include purely compensatory damages which are elusive and therefore difficult to measure accurately.

After giving consideration to the foregoing matters, I am of the opinion that extra damages should be granted in the sum of $900,000.

VI. Conclusion of Law 4.

Plaintiff contends that the Master erred in concluding that the Lincoln Electric Company is not liable to account for the amount of 660 flux sold prior to October 1, 1945, the date this action was commenced. This conclusion is based upon Finding 32. The finding reads as follows:

> "The plaintiff did not mark the number of the patent in suit on the bags of Unionmelt. At the time of the creation of the Lincolnweld 660 flux on August 21, 1942, the defendant Lincoln had actual knowledge of the existence of the patent in suit and its contents and that the plaintiff claimed its Unionmelt flux to be covered by the patent in suit and also had knowledge that its 660 flux might infringe the patent in suit. At no time prior to the commencement of this action on October 1, 1945, did the plaintiff give either of the defendants any notice, either written or oral, that the Lincolnweld 660 flux infringed the patent in suit. Failure to give written notice of infringement to defendants was the result of a deliberate corporate policy on plaintiff's part, undertaken on advice of counsel."

The statute regarding notice, 35 United States Code §287, provides that patentees may give notice to the public that an article is patented by marking a notice to that effect on the package containing it. It also provides that, "In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice."

Plaintiff's bags containing Unionmelt were not marked. Since the Master found that plaintiff gave defendants no notice before suit that the 660 flux infringed their patent, defendants contend that the statute precludes recovery of damages for the infringement occurring before commencement of this action. They cite in support of their contention, *Dunlap* v. *Schofield,* 152 U. S. 244 (1893). Construing the statute, the Court there held in part as follows:

> "The clear meaning of this section is that the patentee or his assignee, if he makes or sells the article patented, cannot recover damages against infringers of the patent, unless he has given notice of his right, either to the whole public by marking his article 'patented', or to the particular defendants by informing them of his patent and of their infringement of it.
>
> "One of these two things, marking the articles, or notice to the infringers, is made by the statute a prerequisite to the patentee's right to recover damages against them. Each is an affirmative fact, and is something to be done by him." (*Ibid.*, 247-8).

Defendants also cite, among other cases, *Smith* v. *Dental Products Co.,* 140 F. 2d 140 (C. A. 7, 1944).

Plaintiff, on the other hand, contends that it was not required to give notice of the infringement *directly* to Lincoln. It says an infringer is accountable for damages if he has actual notice, regardless of the way the infringer gets the notice. It further argues that Lincoln had actual knowledge of infringement; first, because there was wilful infringement; second, because before 1942 Lincoln was aware that plaintiff had sued the Western Pipe and Steel Company in 1936 and obtained a consent decree in 1938 for infringement of the patent and, third, because before suit plaintiff had charged infringement against companies which purchased 660 flux.

Absent the marking of the patented product, the statute requires that the patentee or his assigns prove notification of infringement to the infringer before the latter becomes liable for damages. This requirement makes for fairness. If the article embodying the patent is appropriately marked, the public at large has notice, not only of the patent's existence, but also of the article which is produced according to the patent. If the article is not marked, then notice of the infringement must be given before liability for damages can attach. Were this not required, an innocent infringer might without knowledge or intention subject himself to a claim for damages. When the article embodying the patent is marked the copyist has notice of the patent and must take his risk of infringement. If it is unmarked, he is not required to make a search to learn whether there is a patent covering the article. He can go ahead without risk until he has been notified of an infringement.

I think it is obvious that what has been said about notice relates only to those situations where the infringer is not cognizant of his infringement. It can hardly apply to a conscious and wilful infringer. The Master's Finding 30 reads in part, "... 660 flux was not the result of independent research or experimentation but was copied from the teachings of the patent". One who copies his article from the patent is a conscious and wilful infringer. Notice of infringement under such circumstances would be superfluous. If the statute were construed differently, it would shield not only those who infringe without intention, but it would foster an injustice by shielding the intentional infringer as well.

It is concluded that the Master clearly erred in holding that damages can only be awarded for the infringement by the defendants which occurred subsequent to October 1, 1945.

VII. INTEREST ON THE AWARD.

The Master allowed interest on the recommended award beginning June 4, 1958, the date of the filing of his report. The plaintiff excepts to his disallowance of interest from June 30, 1950, the date of the last infringement.

Defendants contend that the Master was correct in his holding on the question of interest, and cite *Duplate Corporation* v. *Triplex Safety Glass Co.,* 298 U. S. 448, (1935). In that case the Supreme Court said at page 459:

> "If, however, an award of damages upon the basis of a reasonable royalty becomes appropriate again, we think that interest should run from the date when the damages are liquidated, and not, as by the present decree, from the date of the last infringement. (Citations). There are no exceptional circumstances justifying a departure from what is at least the general rule."

It should be noted that in that case the Court pointed out before discussing interest that, "The defendants satisfied the Master that they were not conscious or deliberate infringers. . . . The account is to be stated on the assumption that the defendants, though infringers, have acted in good faith".

As heretofore indicated the Master correctly determined that Lincoln copied the infringing flux from the patent. Also as indicated, Lincoln's conduct was conscious and wilful. It is my opinion that this constituted such an exceptional circumstance as to require that interest on the award of a reasonable royalty be imposed from the date of the termination of the infringement. *Mathey* v. *United Shoe Machinery Corp.,* 34 F. Supp. 694 (D. C. Mass., 1944).

VIII. Conclusion of Law 11.

The Master recommended no allowance for the attorneys' fees expended by Lincoln in defense of the contempt action.

It is provided in 35 United States Code §285 that "The Court in exceptional cases may award reasonable attorney fees to the prevailing party." Defendants contend that this is an exceptional case which requires an award to Lincoln of attorneys' fees as the prevailing party in the contempt action.

Except for defendants' charge that the contempt action was baseless and the result of viciousness, all of their claims that this case is exceptional relate to the original proceeding wherein plaintiff was the prevailing party on the issue of infringement. As to the contempt proceeding it must be noted that the trial court held the defendants in contempt for disobeying the court's injunction against further infringement. The Court of Appeals reversed the trial court, but there is no intimation by that court that the contempt action can be classified as baseless or was initiated because of viciousness on the part of the plaintiff.

The Court of Appeals in *Laufenberg, Inc.* v. *Goldblatt Bros.*, 187 F. 2d 823, (C. A. 7, 1951), and *Wilson* v. *Seng Co.*, 194 F. 2d 399 (C. A. 7, 1952), has laid down the basis for the allowance of attorneys' fees in patent cases. In the *Laufenberg* case the court said:

> "An award of attorney's fees under R. S. §4921 is not the usual or customary procedure in a patent suit. Such an award is not a matter which follows as of course from the decision of the suit, as in the case of ordinary costs. This court has held that such fees are not to be allowed as a matter of course to the prevailing party in the usual patent suit. . . . Other courts have said that such fees may be awarded to prevent gross injustice, . . . and that the statute should be invoked only where vexatious or unjustified litigation is shown. . . ."

Using this criterion I am convinced that the Master was correct in disallowing attorneys' fees to Lincoln relating to the contempt action.

The awarding of costs in a patent infringement suit is within the discretion of the Court. *Duplate Corp. et al.* v. *Triplex Safety Glass Co. of North America* (C. C. A. Pa., 1935) 81 F. 2d 352. In view of the fact that plaintiff's litigation expense was one of the factors considered by the Court in the award of increased damages, the Court will not make an award of costs, as such.

Enter:

LUTHER M. SWYGERT
Judge

Hammond, Indiana
August 26, 1959.

THE UNITED STATES DISTRICT COURT

Northern District of Indiana,
Hammond Division

Union Carbide Corporation, *vs.* Graver Tank & Mfg. Co., Inc. and The Lincoln Electric Company.	No. 607 Civil.

ORDER ON REVIEW AND JUDGMENT.

Union Carbide Corporation, plaintiff herein, having made application to the Court for action upon the report of the Special Master and having filed its objections to the Master's conclusions of law, and Graver Tank & Mfg. Co., Inc. and The Lincoln Electric Company, defendants herein, having filed their objections to the Master's report, all pursuant to Rule 53(e)2 of the Rules of Civil Procedure, the Court, after hearing said application and objections and having filed its opinion, now,

1. Adopts the Master's findings of fact as its own;

2. Modifies the Master's conclusions of law in certain respects and adopts the following conclusions of law as its own:

Conclusions of Law.

1. This Court has jurisdiction of the parties hereto and of the subject matter of this cause.

2. There was no established royalty applicable to the welding composition covered by the four valid claims of the patent in suit.

3. Plaintiff has been unable to and therefore has failed to prove with sufficient accuracy for judicial determination the following:

(a) The amount of its damage from loss of profits it would have made on such additional sales of the patented composition it would have made but for the infringement.

(b) The amount of its damage from loss of additional profit on its sales which would have resulted from higher prices it could, and, but for the infringement, would have charged for the patented composition sold by plaintiff.

4. The plaintiff is entitled to recover from the defendant, The Lincoln Electric Company, as damages, a reasonable royalty in the amount of $1,365,893.50 less a credit of $4,002.25 for license fees paid by Dravo Corporation to plaintiff in connection with the use of Lincoln 660 flux, or the sum of $1,361,891.25. Of the last stated amount the defendant, Graver Tank & Mfg. Co., Inc., is jointly liable with the defendant, The Lincoln Electric Company, to the plaintiff in the sum of $20,966.66.

5. The defendant, The Lincoln Electric Company, is not entitled to any credit by reason of sales of the Lincolnweld 660 flux to companies which signed Unionmelt license agreements with the plaintiff or by reason of payments made by such companies to the plaintiff, except for the sum of $4,002.25, paid by Dravo Corporation and which has been taken into consideration in Conclusion 4 above.

6. None of the sales of Lincolnweld 660 flux is exempt from this accounting by virtue of 36 Stat. 851 (1910), as amended, 28 U. S. C. §1498 (1952), or any other applicable law, except a total of 21,500 pounds sold to the United States Navy.

7. Plaintiff is entitled to interest upon the amount of the recovery under paragraph 4 in the sum of $748,185.91, calculated at the rate of 6 per cent per annum from June 30, 1950, the date of last infringement, to and including this date.

8. Plaintiff is entitled to have the award of damages assessed against the defendant, The Lincoln Electric Company, increased by adding to the amount of the recovery under paragraph 4 above, the additional sum of $900,000.

9. No allowance is made to the plaintiff for attorneys' fees as such in the proceeding leading to the interlocutory Decree dated July 9, 1947.

10. Defendants are not entitled to any allowance for attorneys' fees in defense of plaintiff's motion to adjudge defendants in contempt of court.

11. The plaintiff is entitled to the entry of final judgment against the defendants, The Lincoln Electric Company and Graver Tank & Mfg. Co., Inc., jointly, in the amount of $20,966.66 and against the defendant, The Lincoln Electric Company, alone, in the amount of $1,340,924.59, together with interest on both amounts at the rate of 6 per cent per annum from June 30, 1950; and the plaintiff is also entitled to the entry of final judgment against the defendant, The Lincoln Electric Company, alone, for the additional sum of $900,000. Union Carbide Corporation and The Lincoln Electric Company should be required to pay in equal amounts the compensation of the Master incidental to the account.

JUDGMENT.

Pursuant to the Order on Review, the Findings of Fact, and Conclusions of Law as modified, it is now

ORDERED, ADJUDGED and DECREED that Union Carbide Corporation, plaintiff herein, have and recover from the defendants, Lincoln Electric Company and the Graver Tank & Mfg. Co., Inc., jointly, the amount of $32,485.12 and from the Lincoln Electric Company, alone, the additional amount of $2,977,592.04.

Enter:

LUTHER M. SWYGERT

Hammond, Indiana
August 26, 1959.

IN THE

UNITED STATES COURT OF APPEALS

For the Seventh Circuit.

September Term, 1959, April Session, 1960.

No. 12797 Union Carbide Corporation, Plaintiff-Appellant, *v.* Graver Tank & Mfg. Co., Inc. and The Lincoln Electric Company, Defendants-Appellees.	Appeals from the United States District Court for the Northern District of Indiana, Hammond Division.
No. 12798 Union Carbide Corporation, Plaintiff-Appellee, *v.* Graver Tank & Mfg. Co., Inc. and The Lincoln Electric Company, Defendants-Appellants.	

August 31, 1960.

Before Hastings, *Chief Judge,* Duffy and Major, *Circuit Judges.*

Major, *Circuit Judge.* These appeals are from a final judgment in favor of plaintiff, entered August 26, 1959, after accounting, for infringement of claims 18, 20, 22 and 23 of patent No. 2,043,960 on a welding flux (sometimes referred to as Jones or the patent in suit). Judgment was rendered in the amount of $3,010,077.16, apportioned as follows:

Award of damages based on reasonable royalty	$1,361,891.25
Interest at 6% per annum from June 30, 1950, the date of last infringement	748,185.91
Additional damages	900,000.00

Plaintiff, Union Carbide Corporation (hereinafter referred to as Union Carbide) appeals on the basis that the judgment is grossly inadequate (appeal No. 12797). Defendants, Graver Tank & Mfg. Co., Inc. (hereinafter referred to as Graver) and The Lincoln Electric Company (hereinafter referred to as Lincoln) appeal on the basis that it is excessive (appeal No. 12798).

This action was commenced October 1, 1945, by Linde Air Products Company (hereinafter referred to as Linde) against the present defendants. Linde at that time was a subsidiary of Union Carbide and was subsequently merged into that corporation, which thereupon became the plaintiff. Lincoln (hereinafter called the defendant) since 1907 has been engaged in the manufacture of electric arc welding equipment and supplies and from the beginning has conducted the defense on behalf of both defendants. Graver has a manufacturing plant at East Chicago, Indiana, where defendant's 660 flux, the infringing flux, was used for welding operations during the period of infringement. (The patented flux was called Unionmelt; the infringing flux, Lincolnweld.)

The litigation has been before one court or another from the time it was commenced in 1945, to the present time. Linde in its original action sued on sixteen claims to a process of electric welding and on seven claims to a composition or flux for use in the process. The case was heard by Honorable Luther M. Swygert, who held claims 18, 20, 22 and 23 valid and infringed and composition claims 24, 26 and 27 invalid. He also held all process claims invalid. 86 F. Supp. 191. Upon appeal by both parties, this Court affirmed as to claims 18, 20, 22 and 23, but held valid and reversed the District Court as to all process claims and composition claims 24, 26 and 27. 167 F. 2d 531. The Supreme Court agreed with Judge Swygert *in toto*, both as to claims 18, 20, 22 and 23, which he had held valid and infringed, and as to the other composition and process claims which he had held invalid. 336 U. S. 271.

The valid composition claims were held infringed by Lincoln in the manufacture and sale of its 660 flux. The Supreme Court, upon petition of Graver, granted a rehearing on the issue of infringement, limited to a consideration of the doctrine of equivalents. 337 U. S. 910. The majority of the Court (two Justices dissenting) held that although Lincoln did not utilize the material called for by the claims, the 660 flux infringed by application of that doctrine. 339 U. S. 605.

After the 660 flux was adjudged an infringement by the District Court, Lincoln made and marketed four new fluxes, the 760, 770, 780 and 840 (known as the 700-series fluxes). Union Carbide, on the premise that these new fluxes infringed and, therefore, violated the District Court's decree, brought an action to have defendants adjudged in contempt. This proceeding was heard by Honorable Charles A. Dewey, sitting by special assignment. He held that the new fluxes infringed and that defendants were in contempt. This Court, on the basis of the doctrine of "File Wrapper Estoppel," held that Lincoln's new fluxes did not infringe and reversed the decision of Judge Dewey. 196 F. 2d 103. The Supreme Court denied certiorari, 343 U. S. 967, and petition for rehearing, 344 U. S. 849.

We approach the issues argued on these appeals with knowledge of the careful and extensive consideration which has been accorded to the parties and their respective contentions in the Court below. The accounting proceeding was referred to Honorable Henry R. Sackett, as Special Master, by order dated February 10, 1953. The pre-trial hearing and proceedings extended over a period of three and one-half years. The hearing before the Master occupied a full month, September 25 to October 25, 1956. Twenty witnesses were examined and cross-examined, and the stenographic transcript of the trial came to 3,045 pages. Seven hundred and twelve documentary exhibits were put in evidence. Motion pictures, welding demonstrations and other forms of evidence were presented. Records and exhibits from the previous hearings were incorporated by reference. After the trial, both sides submitted printed briefs to the Master, together with proposed findings of fact and conclusions of law. Oral argument before the Master on these proposed findings occupied four days. The Master, after having the case under consideration for almost a year, submitted a draft report to counsel. Numerous objections were interposed to the Master's proposed findings and conclusions.

Union Carbide in the main acquiesced in the proposed findings but interposed objections to certain of the Master's conclusions. On the other hand, Graver objected to many of the proposed findings, as well as to some of the conclusions. After a hearing on the objections to the proposed report, the Master made a number of changes in his proposed findings and conclusions of law. On June 4, 1958, the report was signed in printed form and filed with the District Court. Objections to the report were argued before Judge Swygert for two days, at the conclusion of which the Court adopted the Master's findings of fact but modified his conclusions of law in certain respects. Union Carbide in its brief states, "It is not likely that any other matter has had more thoughtful and thorough study and attention than the Master's findings in this record." With this statement we agree. In addition to the Master's outstanding work, we are not unmindful of the fact that Judge Swygert, who heard and passed upon objections to the Master's report, has been with this case from its inception in 1945, and has demonstrated a clear understanding of the many difficult and complicated issues which have arisen during the course of the litigation.

Thus, we are possessed of an acute awareness of the force and effect imposed upon a reviewing court by Rule 52 (a) of the Rules of Civil Procedure. Both parties disclaim any intent to attack directly the findings of the District Court; in fact, Union Carbide expressly accepts them. In its brief Lincoln states, "The evidentiary facts in this case are undisputed. The factual issues in this appeal relate to conclusions—*i.e.,* inferences of ultimate fact—drawn by the District Court from underlying facts which of themselves are not in controversy."

DID LINCOLN COPY AND THEREBY BECOME A CONSCIOUS AND WILFUL INFRINGER?

Prior to a consideration of the issues argued by the parties in their separate appeals, it appears appropriate to consider the Master's finding, approved by the Court, that Lincoln's 660 flux "was copied from the teachings of the patent." Based on this finding, the Court characterized Lincoln as a conscious and wilful infringer, notwithstanding that the Master had refused on request to do so. We shall consider this issue in the beginning for the reason that it permeates numerous of the issues raised on both appeals, particularly by Lincoln in appeal No. 12798; in fact, it is controlling as to some of such issues.

In treating the issue we must start, of course, with the premise that Lincoln by the manufacture and sale of its 660 flux infringed the four patent claims which remained in suit. That fact, as already shown, has been adjudicated by the courts up to and including the Supreme Court. The question, however, as to whether Lincoln copied its infringing flux from the teachings of the patent and thereby became a conscious and wilful infringer has not been adjudicated; in fact, it has not been previously in issue. This distinction must be kept in mind in appraising the relevancy of what has heretofore been shown and decided. Another factor is that the issue must be determined in the light of circumstances in existence at the time Lincoln commenced the manufacture and sale of its infringing flux rather than from those after issues have been litigated and determined.

After much thought, we find ourselves in the dark as to what it was that Lincoln copied. The Supreme Court on the second appeal, 339 U. S. 605, 610, stated:

> "The patent under which Unionmelt is made claims essentially a combination of alkaline earth metal silicate and calcium fluoride * * *," and Lincolnweld's composition "substitutes silicates of calcium and manganese—the latter not an alkaline earth metal—for silicates of calcium and magnesium."

Thus, the claims did not call for the use of magnesium, while the infringing flux consisted of more than 90% of manganese silicate, which is not an alkaline earth metal silicate specified in the claims. Certainly under such circumstances no one would contend that the composition of the infringing flux was copied from the claims in suit. The Supreme Court in the last cited case so recognized. It stated (page 607):

> "If accused matter falls clearly within the claim, infringement is made out and that is the end of it."

The Court denied the application of that theory but concluded that the methods by which the compositions were employed were "identical in operation and produce the same kind and quality of weld." It therefore evoked the doctrine of equivalents and held that Lincoln's flux infringed.

In doing so, it appears that the Court relied upon what was disclosed by the specifications rather than that specified in the claims. This was the view held by two Justices who separately dissented. Justice Douglas in his dissent stated (page 618):

> "The claims of the patent are limited to a flux 'containing a major proportion of alkaline earth metal silicate.' Manganese silicate, the flux which is held to infringe, is not an alkaline earth metal silicate. It was disclosed in the application and then

> excluded from the claims. It therefore became public property. See *Mahn* v. *Harwood*, 112 U. S. 354, 361. It was, to be sure, mentioned in the specifications. But the measure of the grant is to be found in the claims, not in the specifications. *Milcor Steel Co.* v. *Fuller Co.*, 316 U. S. 143, 145, 146. The specifications can be used to limit but never to expand the claim. See *McClain* v. *Ortmayer*, 141 U. S. 419, 424."

If Lincoln had copied its flux from the patent, that, as the Supreme Court said, would have been "the end of it," and there would have been no occasion to resort to the doctrine of equivalents. That doctrine rests upon the premise that the infringer made something different. It strikes us as an anomaly to find that Lincoln copied from the patent but that infringement was found only by application of the doctrine of equivalents. The Court, in *Graham* v. *Cockshutt Farm Equipment, Inc.*, 256 F. 2d 358, 359, stated:

> "Infringement exists only if the patentee's arrangement is copied, or if, by use of equivalents, the same arrangement is used except that for some element of it equivalents are substituted."

In our view, the word "copied" as used to describe Lincoln's conduct is a misnomer. It is a conclusion arrived at by process of reasoning with which we do not agree. Moreover, other findings of the Master, subsequently shown, militate strongly against the finding that Lincoln copied. In any event, we do not think it of vital importance whether the finding is approved or rejected because, if approved, it does not under the circumstances support a conclusion that Lincoln was a conscious and wilful infringer. As stated, the Master refused to so conclude and we think for reasons subsequently shown, the Court erred in holding that it was.

Lincoln in developing its infringing flux acted upon the opinion of its patent counsel, Honorable John F. Oberlin, admitted on all sides as an experienced and highly competent lawyer in the field of patent law. Oberlin investigated many process, equipment and flux patents in connection with a "dual-arc process" then being developed by Lincoln. He advised Lincoln that pre-fusing the ingredients of a flux was an old step and that Lincoln could pre-fuse any flux without infringing, so long as it did not contain a major proportion of alkaline earth metal silicate as demanded by the claims. Long before the 660 was first made, he advised Lincoln extensively as to what it could and could not do in respect to welding fluxes. After the 660 had been tested at Graver and before it was placed on the market, Lincoln submitted it to Oberlin to obtain his specific opinion as to whether it could be sold without infringing the patent. By a written opinion dated December 8, 1942, after careful study of plaintiff's patent and the prior art, Oberlin advised Lincoln that plaintiff's asserted patent monopoly over the automatic submerged arc welding process was void, that the broad flux claims were void and that Lincoln's 660 flux did not infringe any of the remaining claims. Oberlin's opinion was vindicated by the courts in all respects except that pertaining to the four claims in suit, which the courts held valid and infringed on the doctrine of equivalents. Even as to these claims his opinion that they were not infringed was agreed to by two dissenting Justices of the Supreme Court.

The above sketchy statement as to Lincoln's relation with its patent counsel and its reliance upon his opinion is fully recognized by the Master in his report. Among other things, he found:

> "After careful study of the plaintiff's patents and the prior art, counsel advised Lincoln that plaintiff's asserted patent monopoly over the submerged arc automatic welding process was void, that the broad composition claims 24 and 26 of the patent were void, and that the 660 flux did not infringe the remaining claims of the patent. Counsel expressed the opinion that Lincoln 660 did not infringe the patent in suit because it was not an alkaline earth metal silicate

> flux and that the valid claims of the patent in suit encompassed only alkaline earth metal silicate fluxes. Lincoln 660 flux is a manganese silicate flux and is not an alkaline earth metal silicate flux. Counsel's advice to Lincoln with respect to the invalidity of plaintiff's asserted monopoly over the submerged arc automatic welding process and with respect to the invalidity of the broad composition claims 24 and 26 was correct and was sustained by the Courts. His advice with respect to the 660 flux proved to be in error by virtue of the Courts applying the doctrine of equivalents and holding the 660 flux did infringe claims 18, 20, 22 and 23 of the patent in suit."

The Master further found:

> "The defendant Lincoln relied on the opinion of Mr. Oberlin that the plaintiff's composition claims were either void or not infringed by the Lincoln 660 by virtue of its being a manganese silicate flux and not an alkaline earth metal silicate flux in major proportion as encompassed by the claims that Mr. Oberlin considered to be valid and in so relying on said opinion *thought lack of infringement by the Lincoln 660 would most likely be established by virtue of the Lincoln 660 being outside the scope of any valid claims of plaintiff's patent.*" (Italics supplied.)

That the issue of infringement was highly doubtful and controversial was also recognized by the Master. He found:

> "The question of infringement was sufficiently doubtful that the Supreme Court granted a rehearing on that issue, and two justices dissented from the final judgment. Plaintiff considered the question whether a manganese silicate flux was the equivalent of an alkaline earth metal silicate flux so doubtful that even after the District Court, the Court of Appeals, and the Supreme Court's first decision had held it was an equivalent, plaintiff nevertheless with-

> held payment of royalties to the inventors on the Unionmelt 50, a manganese silicate flux, until after the second decision of the Supreme Court."

Union Carbide attempts to escape what ordinarily might be expected to follow from Lincoln's activity and conduct based upon the good faith advice of its counsel, through the loophole that Lincoln failed to advise its counsel that its flux was copied from the teachings of the patent. This theory appears to have been embraced by the Master and the District Court. The Master, after finding that Oberlin was a competent and conscientious lawyer and that his opinion was rendered in good faith, found:

> "The defendant Lincoln did not supply Mr. Oberlin with information as to the work done by the Lincoln engineers in creating and compounding the Lincoln 660 flux or the fact that the Lincoln 660 was not the result of independent research or experimentation but was copied from the teachings of the patent * * * Had Lincoln disclosed to its counsel that the 660 flux was copied from the teachings of plaintiff's patent the opinion could, and probably would have, contained an admonition that a copyist was more likely to be found an infringer by the Courts than one infringing as a result of independent research."

The Court went further and stated in effect that Lincoln's failure to advise counsel that it copied showed that it was aware of possible infringement because "otherwise it would not have sought its patent counsel's advice about that possibility." We have difficulty in comprehending this reasoning. Lincoln denies and has always denied that its flux was copied from the patent. Notwithstanding, it appears to be the theory that Lincoln should have advised its counsel that it had done so. It is true that Lincoln not only procured a copy of Union Carbide's patent but also a quantity of its flux for the purpose of analysis. This, so we think, it had a right to do. As stated by this Court in *Atkins et al. v. Gordon*, 86 F. 2d 595, 596:

> "One may legitimately study the patent and microscopically examine the language of the claim in order to make a product which will serve the same purpose and yet avoid infringement of the patent. Such a right is the logical, beneficial result which was sought through the adoption of the comprehensive patent system of our government."

The boundaries of the monopoly which Union Carbide acquired by its patent were defined and limited by its claims. All outside that boundary was in the public domain. We think it does not detract from the good faith of a competitor for him to procure and examine a patent and its claims, as well as the subject matter thereof, in order to ascertain what is open to the public. Moreover, no inference of bad faith can be drawn from the fact that Lincoln procured an opinion from a competent patent counsel. If anything, it shows that Lincoln was making a good faith effort to avoid infringement. The Master in a rather mild fashion appears to so recognize. Referring to Lincoln's preparation of its 660 flux, he found:

> "By making the substitution disclosed in plaintiff's patent of an ingredient (manganese silicate) concerning which Lincoln had independent knowledge of its usefulness in welding fluxes and then proceeding to prepare the 660 flux in accordance with the teachings of the patent, Lincoln sought to stay outside the claims of the patent and to avoid literal infringement of the patent and hoped *and thought it most likely, according to Mr. Oberlin's opinion, that in so doing the 660 flux would be found non-infringing.*" (Italics supplied.)

Furthermore, it should be kept in mind that the legal opinion upon which Lincoln acted was rendered by its counsel on a study of the patent (also other patents in the prior art) and an analysis of Lincoln's flux, subsequently held to infringe. It was upon this basis that he rendered the opinion that there was no infringement.

Neither the Master nor the Court indicates that the opinion of Oberlin would have been different on the question of infringement had he been advised by Lincoln that which it has always denied, that is, that it copied its composition from the teachings of the patent. As already noted, the Master does find that if Oberlin had been notified that Lincoln's composition was copied, he probably would have included in his letter an admonition "that a copyist was more likely to be found an infringer by the Courts than one infringing as a result of independent research." Considering the fact that Oberlin had all the necessary information to render an opinion, it is purely a matter of speculation as to what he might have added had he been informed by Lincoln that its composition was copied. Certainly there is no reason to believe that his opinion on the question of infringement would have been different.

The admittedly good faith opinion by Oberlin, and more particularly Lincoln's good faith in acting in accordance therewith, is strongly buttressed by evidence which was before the Court but not introduced at the hearing before the Master. It consists of representations made to the Patent Office in applications for patents by Edwin A. Clapp and W. D. Miller, which resulted in the issuance of No. 2,200,737 to Clapp and No. 2,308,194 to Miller. Both of these applications were prepared by the same solicitors who prepared the application for the patent in suit, and both patents are now owned by Union Carbide. Both the Clapp and Miller patents issued on the premise that they disclosed patentable improvement over the prior art. The patent in suit was cited as such and material representations were made under oath to the Patent Office in an effort to avoid its teachings.

In Clapp's application he, who was a welding engineer in charge of Union Carbide's research laboratories, stated, "While this reference [referring to Jones] broadly suggests that manganese oxide may be present, there is clearly no teaching for what purpose or in what amounts it is to be added." There was submitted in support of Clapp's application an affidavit by James M. Keir, who had been engaged for fifteen years in the design, testing and supervision of welding equipment. He stated that he was familiar with the progress and status of the art, that Clapp's application described "the use of an alkaline earth metal silicate welding composition containing manganese oxide within the range of 4% to 16% of the composition," and that the "Clapp invention contributes a novel and unobvious advance in the welding art not apparent from the teaching of U. S. patent No. 2,043,960 [Jones]."

The Miller patent relates to a process of electric welding by means of a pre-fused welding composition containing from 30% to 65% of manganese oxide, 9% to 40% of alumina, and the remainder principally silicate. An affidavit by Clapp was submitted in support of the Miller application, in which he stated that when he filed his application which matured into patent No. 2,200,737, he was of the opinion that in welding sulfur-banded steel by a process of the type disclosed in patent No. 2,043,960 (Jones), using a manganese-containing welding medium, "the welding conditions were adversely affected if the manganese percentage was above 16% calculated as MnO, and it is surprising to me in view of my own work in connection with the problems encountered in welding sulfur-banded steel that the use of the welding medium defined in the above identified application produces entirely satisfactory results even though the manganese content is far higher than I had thought permissible." He further stated, "It is my opinion based upon my experience in the type of welding disclosed in patent No. 2,043.960 [Jones] that the results obtained by the use of the welding medium disclosed in the above identified application could not have been predicted from the disclosures of the cited references and that the welding composition described possesses advantages over other compositions which render its use commercially attractive."

Thus, in résumé, the skilled representatives of Union Carbide told the Patent Office, referring to the Jones patent, that "there is clearly no teaching for what purpose or in what amounts it [*i.e.*, manganese] is to be added." In fact, Clapp found out only "after a great deal of experimentation" that it would be possible to use as much as 4% to 16%, and this, he and his colleagues said, was "surprising, new and unobvious," and was "not apparent from the teaching of U. S. patent No. 2,043,960 [Jones]." In view of this appraisement by Union Carbide's experts, it is paradoxical that Lincoln's infringing flux with its 95% manganese silicate has been or could on any logical basis be held to have been copied from such teachings.

It is suggested that these representations made to the Patent Office are immaterial as they bear only upon the issue of infringement which has been adjudicated adversely to Lincoln. True, that issue is no longer open but, even so, it is an interesting, though futile, matter for speculation as to what the courts would have decided on the issue of infringement if they had been favored with the appraisement which Clapp and Miller later placed upon the teachings of the Jones patent. The representations thus made, however, are relevant because they not only fortify the soundness of the opinion which Lincoln obtained from its counsel but they come close to demolishing any basis for a finding that Lincoln copied its infringing flux from the teachings of the patent and thereby became a conscious and wilful infringer.

Another facet of the argument relied upon in support of the thesis that Lincoln's infringing flux was copied from the teachings of the patent arises from the Master's finding "that the 660 flux was not the result of independent research or experimentation." The Supreme Court in its second Graver opinion, 336 U. S. 271, 276, stated:

> "The petitioners introduced no evidence to show that their accused flux was derived either from the prior art, by independent experiment or from any source other than the teachings of the patent in suit."

Lincoln in the instant proceeding, in response to this observation so we assume, introduced a large volume of testimony, not to disprove infringement but to show that its infringing flux was not copied from the teachings of the patent and that it therefore was not a conscious and wilful infringer. In this connection the Master found:

> "The defendant Lincoln had knowledge independent of plaintiff's patent that manganese silicate was a useful ingredient for welding fluxes. * * * The defendant Lincoln in making its 660 flux substituted manganese silicate for the alkaline earth metal silicates described in the claims of the patent, and with this substitution then proceeded to prepare the 660 flux in accordance with the teachings of the patent."

Thus, it is recognized that Lincoln had knowledge that manganese silicate, of which its flux was largely composed, was a useful ingredient and substituted it for the alkaline earth metal silicates described in the claims. This, however, according to the opinion of its counsel, Lincoln had a right to do. The fact that such substitution was later held by the courts to be an equivalent and therefore an infringement does not reflect unfavorably on the good faith opinion rendered by counsel; neither does it justify branding Lincoln as a conscious and wilful infringer. Even the Master appears to have equivocated on the issue of good faith. He did not find that Lincoln acted in bad faith or that good faith was lacking; instead he found that Lincoln "did not act in *wholly good faith* belief that it was acting within its legal rights as to the 660 flux." (Italics supplied.)

The argument presented here is permeated with the idea that because "a parade of judges" has adjudicated Lincoln an infringer, it follows that such infringement was conscious and wilful. Such thought is beside the issue as to whether Lincoln honestly and in good faith believed that its 660 flux was not an infringement. We repeat the finding of the Master:

> "Lincoln sought to stay outside the claims of the patent and to avoid literal infringement of the patent and hoped and thought it most likely, according to

> Mr. Oberlin's opinion, that in so doing the 660 flux would be found non-infringing."

Bad faith should not be attributed to Lincoln because it contested and lost on the issue of infringement. Many a legal battle has been fought honestly and in good faith, but lost. Union Carbide has shared in that experience in the instant prolonged litigation. It attempted all the way to the Supreme Court to sustain the validity of sixteen process and seven composition claims. It lost as to all of the former and three of the latter. It attempted without success to obtain an adjudication that Lincoln was an infringer because it made and marketed four new fluxes, known as the 700-series. In these matters, as well as in others, it no doubt acted under the advice and guidance of its experienced and competent counsel. But the fact that it lost does not, in our view, raise an inference that it or its attorneys acted in bad faith. Neither do we think on this record that Lincoln can properly be charged with bad faith or characterized as a conscious and wilful infringer when it acted under the advice of equally experienced and competent counsel.

Another thought in connection with the good faith issue arises from Judge Swygert's observation that Lincoln was "aware of possible infringement." We think the observation is valid but we also think it could be made in all instances where there is a question as to what a patent encompasses. In fact, we suppose awareness of the possibility of infringement is always present, or should be, when the manufacture and sale of a new article or product is commenced. It is for that reason that competent patent counsel is called upon for advice and, as shown, that was the course pursued by Lincoln.

Union Carbide in its brief states, "To say at this stage that infringement was doubtful is really 'whistling by the graveyard.'" This sage observation obviously is true at the present time; however, we are now concerned with Lincoln's situation as it was some eighteen years ago. If its foresight had been as good as its hindsight, it no doubt would have acted differently. Unfortunately such was not the case. If Lincoln, and Union Carbide as well, had then known what they know now this prolonged and expensive litigation would have been avoided.

That the rights of the parties in 1942 were uncertain and doubtful is admitted on all sides. As previously shown, the Master so found and the Court approved. Union Carbide thought the issue was doubtful. The Master found that even after the Supreme Court's first decision it "withheld payments of royalties to the inventors on the Unionmelt 50, a manganese silicate flux, until after the second decision of the Supreme Court." At that time Union Carbide wrote to the inventor, "There is a question as to whether Lincoln's 660 infringes the valid composition claims of the patent." As Mr. Justice Black said in his dissenting opinion, 339 U. S. 605, 617,

> "I think petitioners had a right to act on the belief that this Court would follow the plain mandates of Congress that a patent's precise claims mark its monopoly boundaries, and that expansion of those claims to include manganese could be obtained only in a statutory reissue proceeding."

It is, therefore, our conclusion and we so hold that there is no substantial support for the finding, if such it may be characterized, that Lincoln copied its infringing flux from the teachings of the patent and, in any event, there is no basis for a conclusion that Lincoln in the manufacture and use of its 660 flux was a conscious and wilful infringer.

Appeal No. 12797.

Union Carbide appeals on the ground that the judgment in its favor is grossly inadequate. Based upon accounting statements introduced in evidence, Union Carbide in its brief states:

> "The proof established that plaintiff's Unionmelt Division had suffered a substantial shrinkage in its margin of profit during the period of infringement. The total loss as computed on this basis came to $8,521,234."

This shrinkage was predicated upon a comparison of the period prior to infringement, 1937-1942, with the period of infringement, 1943-1950. We think it not essential to relate the complicated process by which Union Carbide calculated the amount of its loss. The Master found that its computed loss was as follows:

"Loss suffered on sales of patented composition and royalties	$5,356,462
Loss suffered on other Unionmelt operations	3,164,771
Total loss suffered on Unionmelt operations	$8,521,234"

As to the infringing flux, the Master found:

> "The Lincoln Company produced 40,998,305 pounds of the 660 flux. The net sales thereof during the period of infringement, 1942-1950, totaled $4,353,777.12 and Lincoln's profit thereon before Federal income taxes was $940,275.60. More than 99% of all the 660 flux was sold to purchasers who were already customers of Lincoln for other products."

Thus, Union Carbide claims that it was entitled to a judgment of $8,521,234, when Lincoln's net sales of the infringing composition totaled only $4,353,777.12, on which it realized a profit of $940,275.60. (This makes no allowance for Federal income taxes.) The mere statement of these facts presents a serious challenge to the validity of plaintiff's contention.

The loss thus computed by Union Carbide was rejected by the Master and the Court as a basis for an ascertainment of its damages. This was for the reason that the assumptions upon which the calculation rested were contrary to fact.

In this connection, the Master found that the computations treated income realized upon the license by which Union Carbide exploited its process (until the process claims were declared invalid) "as if it were income from flux sales," whereas, said the Master, "this is not the fact." The computation thus "ignores the fact that the plaintiff, when the royalties were paid, was illegally claiming a patent monopoly over the submerged arc welding process. Only a part of the royalty paid by the licensees was for the use of the patented flux." The Master found:

> "The computations * * * assume that the decline in plaintiff's profit to expense ratio * * * was the direct and sole result of the infringement on the part of Lincoln. This is not the fact."

The Master further found:

> "The computations * * * assume that the plaintiff would have sold all of said flux if Lincoln had not infringed. This is not the fact. A substantial part of such sales would have been made by plaintiff but not all of them."

Union Carbide's calculations were based upon a comparison of its profits during the five year non-infringing period (1937-1942) with the infringing period (1943-1950). Such comparison was recognized by the Master and the Court as proper, providing the figures employed were relevant to the issue for decision, that is, Union Carbide's loss by reason of Lincoln's sale of the 660 flux. However, Union Carbide made no such comparison. Instead, its comparison was based upon profits derived from all of its arc welding business, including not only its flux but also process license royalties, welding machines, welding equipment and welding rods. All of these items other than its flux were outside the scope of its patent monopoly.

We need not dwell at length on the accounting method thus employed by Union Carbide as proof of lost profits. It is illustrative and sufficient, we think, to refer to that portion of its calculations relative to royalties received from its licensees. The licenses covered numerous items other than its flux, including its process claims held invalid and other patents owned by Union Carbide. A reading of these license agreements strongly suggests that the process disclosed by the patent was an important consideration for the royalties paid by licensees. This computation of "loss suffered on sales of patent composition and royalties" amounts to $5,356,462.

Union Carbide in its brief states that Peter Pirnie, Jr. was chief accounting officer in charge of its books and records and supervised the preparation of the accounting statements. Lincoln asserts in its brief that the technique employed by Union Carbide in combining the figures on flux with royalties on the invalid process was "devised specifically for this case." There is support for this accusation. Pirnie testified that he mixed flux with other products even though it would have taken less time to give the figures on flux alone. He testified that he did this because "that is the way I was asked to develop the situation, and that is the way we set it up," and "I am not setting the policy in this particular case." Pirnie was asked, "Then there is nothing in your former treatment of the breakdown of this composite Unionmelt enterprise that indicates any reason for combining the flux sales with the license income as one category, and the other two items, Unionmelt equipment and Unionmelt rod as another category?" and responded, "I don't know. This was done according to the way people at that time in charge wanted it done, I suppose, and that is how we did it. * * * I did what I did per—in accordance with the request of our counsel."

Union Carbide's method of computing its loss as a basis for the award of damages was rejected by the Master and confirmed by the Court. The Master's conclusion of law in this respect, which Union Carbide challenges in this Court, is as follows:

> "Plaintiff has been unable to and therefore has failed to prove with sufficient accuracy for judicial determination the following:
>
> "(a) The amount of its damage from loss of profits it would have made on such additional sales of the patented composition it would have made but for the infringement.
>
> "(b) The amount of its damage from loss of additional profit on its sales which would have resulted from higher prices it could, and, but for the infringement, would have charged for the patented composition sold by plaintiff."

Judge Swygert, in overruling Union Carbide's objection to this conclusion, stated:

> "I think the Master properly rejected the profits-to-expense ratio method in this case in recommending the amount of damages. The license agreements included a royalty on both the process and the composition claims of the patent. What plaintiff would have charged as a royalty on the composition claims alone from the starting period of infringement to February 28, 1949 is purely a matter of speculation. * * * The scope of the invention is measured by what has been determined by the Court, not by the claims granted by the Patent Office. Since the invention is now limited to four composition claims, plaintiff's royalty payments based on the invalid process claims cannot be included in a proper base for determining the amount plaintiff lost by reason of the infringement."

Union Carbide contends that the fact of loss having been determined as a consequence of Lincoln's infringement and the total amount of such loss having been determined, it then became the burden of Lincoln to prove the portion of such loss not due to Lincoln's infringement. Three cases are cited in support of this contention. *Westinghouse Electric & Mfg. Co.* v. *Wagner Electric & Mfg. Co.*, 225 U. S. 604; *Bigelow et al.* v. *RKO Radio Pictures, Inc.*, 327 U. S. 251, and *Anderson et al.* v. *Mt. Clemens Pottery Co.*, 328 U. S. 680. As Union Carbide suggests in its brief, *Westinghouse* is the only case involving patent infringement.

Both parties in their briefs have discussed *Westinghouse* at length, and we have given it careful study. We think a brief statement of the facts is sufficient to disclose the issue which the Court decided. The patent was on a transformer used in the transmission of electric power. Infringing transformers sold by Wagner had features disclosed by the patent, together with others developed by Wagner. In other words, Wagner sold a transformer which by the addition of certain features made it an improvement over the patent in suit. The Master, on accounting, found Wagner's total profit on the sale of transformers and that all of the commercial value was due to the use of the patent claims. The Court of Appeals for the Eighth Circuit (173 F. 361, 367-368) held in effect that the improvements made by Wagner were substantial and produced the desired result more certainly and efficiently. That Court also held that the burden of apportionment was upon the patentee, and that it having failed to allocate the profits as between the patent features and other features was entitled to a decree only for nominal damages.

The Supreme Court, after discussing the general rule which places the burden upon the patentee to prove its loss of profits, came to the issue as to which party had the burden in a situation where it was impossible for the patentee to prove the portion of the infringer's profits resulting from use of the patent and that from use of features outside the patent. The Court pointed out that plaintiff had called witnesses employed by defendant to keep the books, purchase the material, superintend the construction and fix the price of the transformers, none of whom was able to show that profits had been made and consequently was not able to show what part of the profits was attributable to the patent and what to the non-infringing improvements. The gist of the Court's decision and its reason therefor is contained in the following statement (page 618):

> "But when a case of confusion does appear,—when it is impossible to make a mathematical or approximate apportionment,—then, from the very necessity of the case, one party or the other must secure the entire fund. It must be kept by the infringer or it must be awarded by law to the patentee. On established principles of equity, and on the plainest principles of justice, the guilty trustee cannot take advantage of his own wrong. The fact that he may lose something of his own is a misfortune which he has brought upon himself; and if, as argued, the fund may have been made by the use of other patents also, for which he may be liable in another case, it is again a misfortune which he has brought upon himself and an instance of a double wrong causing double liability."

It is apparent that the facts in *Westinghouse* are in marked contrast to those here. In that case, profits resulted from the sale of transformers, portions of which were covered by the patent and others which were not. A portion of the profits belonged to the patentee and a portion to the infringer. They were commingled by the infringer in such a manner that apportionment by the patentee was impossible. If the infringer desired to extricate himself from a situation of his own creation, the Court said the burden was on him to do so. In contrast, we have a situation here where the Master specifically found, as previously noted, the total amount of infringing flux sold by Lincoln, the amount received therefor and the profit derived therefrom. The confusion which Union Carbide visualizes resulted from its own system of bookkeeping and its manner of doing business. It granted licenses and received royalties not only on its flux but on its process claims and other patents, all of which it commingled. We agree that Lincoln took the risk incident to its infringement, but it did not take the risk incident to the program of Union Carbide by which it extracted royalties based in part upon a process which was held invalid. And neither did Lincoln take the risk inherent in the situation created by Union Carbide whereby its profits from all its business were lumped together. Certainly there was no burden on Lincoln to extricate Union Carbide from this situation of its own creation.

Our interpretation of *Westinghouse* finds support in *Hamilton-Brown Shoe Co.* v. *Wolf Brothers & Co.*, 240 U. S. 251, a suit for trademark infringement, which the Court compared with the analogous situation in suits for patent infringement. Following the citation of numerous cases, the Court stated the general rule as follows (page 260):

> "In such case, where the invention is used in combination with other elements of value not covered by the patent, so that plaintiff's patent creates only a part of the profits, he is entitled to recover only that part, and must give evidence tending to apportion the profits between the patented and unpatented features."

The Court stated:

> "But, as pointed out in the *Westinghouse* Case (p. 618), there is a recognized exception where the plaintiff carries the burden of proof to the extent of showing the entire profits, but is unable to apportion them, either because of the action of the wrongdoer in confusing his own gains with those which belong to plaintiff, or because of the inherent impossibility of making an approximate apportionment. There, 'on established principles of equity, and on the plainest

> principles of justice, the guilty trustee cannot take advantage of his own wrong.' "

Neither *Bigelow* (327 U. S. 251) nor *Anderson* (328 U. S. 680) supports the contention that Lincoln carried the burden of proof as to the apportionment of profits. While neither of these cases was an action for infringement, the Court in *Bigelow* discussed the rule in such cases and cited *Westinghouse* and *Hamilton* in support of the following statement (page 265):

> "And in cases where a wrongdoer has incorporated the subject of a plaintiff's patent or trade-mark in a single product to which the defendant has contributed other elements of value or utility, and has derived profits from the sale of the product, this Court has sustained recovery of the full amount of defendant's profits where his own wrongful action has made it impossible for the plaintiff to show in what proportions he and the defendant have contributed to the profits."

Anderson was an action by employees against an employer to recover sums claimed to be due under the Fair Labor Standards Act. The Court placed the burden on the employer because (page 687):

> "* * * it is the employer who has the duty under Sec. 11 (c) of the Act to keep proper records of wages, hours and other conditions and practices of employment and who is in position to know and to produce the most probative facts concerning the nature and amount of work performed."

In the instant situation, however, it was Union Carbide, not Lincoln, who had the duty and who was in a position to know if it was damaged and, if so, the extent thereof.

Union Carbide argues that in any event the process and composition claims stated a single invention and that the invalidation of the former had no appreciable effect upon the royalties paid by its licensees. It states in its brief, "any diminution attributable to loss of the 'process' claims was *de minimis.*" This is a strange argument following Union Carbide's effort, asserted through all the courts, to sustain the validity of its process claims. Particularly is it so to this Court, which was persuaded to the view that such claims were of great merit and sustained their validity. 167 F. 2d 531. If this concession had been made in the beginning, much extensive litigation and labor on the part of counsel and the courts might have been avoided, or at least greatly reduced. However, in the brief before this Court we were told by Union Carbide, among other things, that the Trial Court "was unwarrantedly harsh" when it "deprived the inventors of protection for their valuable process * * *"; "These are claims to a process. They are drawn to a process of electric welding. They are not claims to a composition of matter or chemical compound," and "In the patent in suit the inventors had not only to devise a new process but also to invent an entirely new agent for use in that process."

Union Carbide professes to discern some relevancy in the Master's "copying" finding and the Court's characterization of Lincoln as a "conscious and wilful" infringer. We have already discussed and expressed our disagreement with that finding and the conclusion drawn therefrom. However, even if the finding and conclusion were accepted, we think it would be of no consequence to the issue under consideration, that is, that the showing made by Union Carbide as to its claimed damages cast the burden of proof upon Lincoln.

We agree with the conclusion of law under attack and the rejection by the Master, approved by the District Court, of the method employed by Union Carbide in its attempt to prove damages.

Appeal No. 12798.

On this appeal Lincoln attacks the judgment as excessive in numerous respects. The Master and the District Court, as shown in appeal No. 12797, rejected the method proposed by Union Carbide for the ascertainment of its damages. In the absence of an established royalty, the Master resorted to the statute which provides for an award of damages "adequate to compensate for the infringement, but in no event less than a reasonable royalty for the use made of the invention by the infringer" (Title 35 U.S.C.A. Sec. 284). The Court approved the action of the Master in this respect and no question is raised here as to this method of computing plaintiff's damages.

The Master found the total poundage of the infringing flux manufactured and sold by Lincoln. The poundage thus found was divided between that sold before and after the filing of the complaint (October 1, 1945). A royalty of 5¢ per pound was calculated by the Master only on the latter, which amounted to $1,212,545.86. The Court increased this amount to $1,361,891.25, by applying the royalty rate determined by the Master to the flux sold by Lincoln prior to the filing of the complaint. The Master awarded as compensatory damages the sum of $600,000, which was increased by the Court to $900,000. The Master refused the allowance of interest for the period prior to the time damages were determined on the coming in of the Master's report. The Court overruled the Master in this respect and included in the judgment interest in the sum of $748,185.91, calculated from June 30, 1950, when infringement ceased, to August 26, 1959, when the judgment was entered.

The contested issues emerge from Lincoln's contention that the Court and the Master applied erroneous standards in determining a reasonable royalty; that the Court erred in increasing the total amount of the royalty, in awarding increased damages and in allowing interest prior to the time damages were liquidated. There is the further contention that there was error in the Master's denial, affirmed by the Court, of Lincoln's request for an allowance of attorney fees incurred in the defense of the action for contempt instituted by Union Carbide. As previously noted, defendant was adjudged in contempt by the District Court, which ruling was reversed by this Court (196 F. 2d 103). In that proceeding, this Court referred to the District Court Lincoln's application for the allowance of attorney fees.

The Master made numerous findings which portray a situation from which he was required to determine a reasonable royalty. A review of his findings in detail would serve no good purpose. The critical finding is as follows:

> "Applying the reasonable royalty method of computing damages to the evidence and to the findings of fact herein set forth and with due consideration of the evidence and the findings herein concerning plaintiff's loss of sales of flux and loss of profits on sales of flux and welding equipment and supplies during the infringement period resulting from Lincoln's infringing activities, the minimum royalty that the plaintiff should be willing to accept and the defendants should be willing to pay for the right to make, use and sell the patented composition and being a reasonable royalty, was the sum of 5 cents per pound of rod deposited."

The Court, on Lincoln's objection to the Master's finding, stated:

> "Unless it can be determined that the Master's finding in fixing a reasonable royalty at 5 cents per pound of rod deposited is clearly erroneous, Rule 52 (a) of the Federal Rules of Civil Procedure prevents the setting aside of the finding. The Master heard a lengthy trial. He also had the benefit of extensive briefs and arguments. Although these factors, themselves, do not insure against error, they do support the view that the issue in regard to the amount of a reasonable royalty was presented before the Master in a manner to afford full and deliberate consideration of the evidence. The evidence, as well as the Master's related findings of fact, sustain the conclusion that on this point the Master was not in error."

Lincoln argues that the Court failed to apply three recognized rules in the determination of a reasonable royalty:

(1) that it failed to apply the willing seller and willing buyer rule; (2) that it failed to measure the margin of superiority of the patent flux over non-infringing alternatives, and (3) that it failed to confine the royalty to the use made of the invention and to exclude all else.

The willing seller and buyer rule is aptly stated in *Horvath* v. *McCord Radiator & Mfg. Co.*, 100 F. 2d 326, 335, as follows:

> "In fixing damages on a royalty basis against an infringer, the sum allowed should be reasonable and that which would be accepted by a prudent licensee who wished to obtain a license but was not so compelled and a prudent patentee, who wished to grant a license but was not so compelled."

We think this Court is in no position to say that the rule was not considered and applied by the Master and the Court; in fact, the Master in his finding fixing a royalty rate of 5¢ per pound stated that it was "the minimum royalty that the plaintiff should be willing to accept and the defendants should be willing to pay." (See finding lastly above quoted.)

Lincoln's contention that the Court failed to take into consideration that during all the infringement period it had available alternative fluxes which it could have used had there been reason for supposing its counsel was wrong in advising that the 660 flux did not infringe, presents a more serious question. It is argued that the findings of the Master, approved by the Court, disclose that Lincoln had available for its use 620 and 650 fluxes during the period from October 8, 1942, when infringement started, until July 1, 1948, and from the latter date until the end of infringement it had available its 700-series fluxes. On this premise it is contended that under the decision of this Court in *Columbia Wire Co.* v. *Kokomo Steel & Wire Co.* 194 F. 108, the measure of recovery could only be the difference between the infringing flux and those which Lincoln had available as alternatives.

The Master found:

> "The use of the Lincoln 620 and 650 fluxes * * * did not produce wholly satisfactory welding results while the Lincolnweld 660 flux produced excellent results. Lincoln at the time it introduced its 660 flux did not have any substitute or alternative fluxes which would produce welding results equal to those produced by the use of Lincolnweld 660 or Unionmelt."

This finding is supported, in fact amplified, by the testimony of Lincoln's witness Smith, who admitted he encountered difficuities with porosity when he welded with the 620 flux. As to the 650 flux, he conceded that he was "by no means satisfied with what had been accomplished" and that it was "not ready to turn over to the customer." As far as we are aware, there was no proof that either of these fluxes was salable or that Lincoln ever attempted to place either upon the market.

In response to Lincoln's contention that in fixing a reasonable royalty the Master did not consider the available alternative non-infringing fluxes, the Court stated:

> "In support of their position they cite *Columbia Wire Co. v. Kokomo Steel & Wire Co.*, (C.C.A. 7. 1911) 194 Fed. 108. I think this case states the law as to the effect to be given to noninfringing articles available to the public which may be used as alternatives for the patented article. * * *
>
> "The difficulty with defendants' position is that until Lincoln developed the 700-series of fluxes there were no noninfringing fluxes available that were as good in performance as the patented composition. The Master's finding that '* * * the use of Lincoln 620 and 650 fluxes at the Graver plant did not produce wholly satisfactory welding results while the Lincolnweld 660 flux produced excellent results' is supported by the evidence."

Union Carbide, like the Court, recognizes the validity of the *Columbia Wire* rule and also, like the Court, reasons that it is without application to the facts as found. With this reasoning we agree as it relates to the 620 and 650 fluxes. Their utility was near zero and they were never sold or offered for sale to the public. Under such circumstances, there is little, if any, room for the belief that they could have been used by Lincoln as a substitute or alternative for the patent flux.

As to the 700-series fluxes, a different situation is presented. As to these the Master found:

> "Near the end of the period of infringement, after adverse decisions of the Court of Appeals and the United States Supreme Court, the Lincoln engineers were able to develop and field test non-infringing fluxes and to substitute them commercially for the infringing 660, as follows:
>
> "The 770 flux was first field tested in July, 1948, and was first shipped commercially in September, 1948."

This 770 flux was superseded by the 780 and 760 fluxes, the first of which, according to the findings, was "shipped commercially in March, 1949" and the latter, "shipped commercially in June, 1950." The Master also found:

> "These fluxes are made from the same raw material as 660 and cost less than 660 to manufacture."

The main contention of Union Carbide on this point is that the 700-series fluxes were not available to Lincoln during the infringing period. (The second period of infringement extended from July 1, 1948 to June 17, 1950.) The findings as shown are to the contrary. Moreover, there is testimony to the effect that these 700 fluxes were as good as the patent flux, that they were interchangeable with Lincoln's infringing flux and that more than eleven million pounds of these fluxes were sold and commercially used during the period of infringement. That they were as good in performance as the patent flux was recognized by the Court, as previously shown.

The Court did not deny the application of the *Columbia Wire* rule to the 700-series fluxes because they were not as good as the patent flux or because they were not available as a substitute or alternative. Rather, the Court stated:

> "As for the 700-series fluxes, the answer to defendants' argument is that even though Lincoln developed this noninfringing flux in 1948, it continued to produce and sell the infringing flux until the issuance of the Supreme Court's mandate in June, 1950."

In our view, this statement does not meet the problem. It is only where the infringer continues to produce and sell the infringing product that the rule under discussion is applicable. Certainly there can be no application, in fact no reason for its existence, in a situation where the infringer discontinues the production and sale of the infringing article. In such a situation there would be no difference to measure. We think and so hold that the rule must be applied to the second period of infringement, that is, from July 1, 1948 to the end of infringement, during which time Lincoln's 700-series fluxes were available as substitutes or alternatives to its infringing flux.

The contention that the Court failed to confine the royalty to the use made of the invention is stated in Lincoln's brief as follows:

> "The District Court required that Lincoln pay tribute to Union Carbide not only on 'the invention' but also on a host of products not covered by the patent."

As already noted, the statute authorizes a reasonable royalty "for the use made of the invention by the infringer * * *." The Master found that during the period of infringement Lincoln sold non-infringing machines, equipment and supplies, usable with the 660 flux, amounting to $9,138,194.99, on which Lincoln's profit before taxes was $1,393,042.39, and also sold non-infringing machines, equipment and supplies, not usable with the 660 flux but purchased by customers who had purchased 660 flux, amounting to $99,194,605, on which Lincoln's profit before taxes was $15,228,416, and after taxes $8,468,708.

The Master in his report stated that he did "take into consideration the fact that Lincoln did sell welding supplies, equipment and machines usable both with and independent of its 660 flux and the extent of such sales and the profit it made from such operations in arriving at a reasonable royalty for the 660 flux * * *." The Master in justification of his action in this respect stated:

> "The fact that Lincoln had such sales of supplies, equipment and machines and the extent thereof and the profit therefrom was given weight by me in arriving at the conclusion that in the hypothetical negotiation of a reasonable royalty the parties would have taken such facts into consideration and that Lincoln as a proposed licensee would be willing, if thought necessary and desirable, to charge part or all of the royalty agreed upon to other operations rather than include the royalty in the selling price of its 660 flux."

The Court approved the Master's report concerning the matter under discussion. We agree with this approval, even though the question, in our view, is not entirely free from doubt. It must be kept in mind that the Master calculated no royalty upon the sale by Lincoln of non-infringing material, but that such royalty was confined solely to the sale of the infringing flux. It seems a logical and commonsense view that Lincoln, if it had been negotiating with Union Carbide for a license, would have taken into consideration all advantages which might accrue to it in determining a royalty which it would be willing to pay. A license to sell the patent flux would have enabled

Lincoln to expand its business, increase its sales of non-infringing materials and thereby increase its profits. Absent a license, Lincoln accomplished the same result by the sale of its non-infringing material in connection with the sale of its infringing flux. In another setting, as previously noted, Lincoln argues that the Court failed to apply the willing seller and willing buyer rule, but here, so it seems, it would have the Court ignore that rule.

Lincoln argues that the Master and the Court, in determining a reasonable royalty, were inconsistent in excluding sales of its 700-series non-infringing fluxes and in giving consideration to its sales of non-infringing materials and supplies. We do not think so. At any rate, we are unable to discern how a license to sell the patented flux would have aided Lincoln in the sale of its non-infringing 700-series fluxes. In contrast, as we have shown, the right to sell the patented flux in all probability would have resulted in an advantage in the sale of non-infringing materials and equipment to be used in connection therewith.

We shall not attempt to cite or discuss the many cases relied upon by the parties in support of their respective positions on the issue under discussion. It is sufficient to state that we find nothing in the case law which requires a result different from that which we have stated. Perhaps we should mention *Egry Register Co.* v. *Standard Register Co.*, 23 F. 2d 438, and *Autographic Register Co.* v. *Sturgis Register Co., et al.*, 110 F. 2d 883, both Sixth Circuit cases. Union Carbide relies upon the former and Lincoln upon the latter. Both parties in their briefs discuss these cases in great detail and are in violent disagreement as to what they stand for. Our study of them makes such disagreement understandable. In our view, neither case is controlling here. The statute in effect at the time they were decided permitted the recovery of "profits" made by the infringe . In *Egry*, the Court, as we understand, permitted plaintiff to recover profits from the sale of a certain class of non-infringing material but not of another class, depending upon whether such non-infringing material was sold for use with and in connection with the sale of the infringing device. The plaintiff's proof having failed to apportion the profits derived from the sale of these two classes of non-infringing material, the Court resorted to the willing seller and willing buyer rule in determining a reasonable royalty. In so doing it held that sale of related non-infringing supplies and equipment might be considered.

Lincoln contends that the Court in *Autographic Register* overruled its previous decision in *Egry*. We do not think so. In the *Autographic* case the Court stated (page 884):

> "The principal legal question presented is whether the District Court erred in not requiring an accounting for defendants' profits and plaintiff's damages in the sale of these unpatented supplies for use on infringing machines."

The Court, in answering this question in the negative, held that the plaintiff was not entitled on accounting to recover profits derived from the sale of non-infringing supplies. On the main feature of the case there was no question concerning a reasonable royalty and consequently no reason for the Court to determine the factors which might be properly taken into consideration in fixing such a royalty. In other words, there was no occasion under the circumstances to apply the willing seller and willing buyer rule.

Lincoln cites cases for the rule "that a patentee may not levy tribute on non-infringing products." We think such cases are beside the point. There is here no levy of tribute on non-infringing products, but the sale of such products has only been taken into consideration among numerous other factors in determining the reasonable royalty which Lincoln would have been willing to pay if it had negotiated for a license.

ADDITIONAL COMPENSATORY DAMAGES.

This brings us to Lincoln's contention that the Master and the Court erred as a matter of law in awarding additional compensatory damages, determined by the Master in the amount of $600,000, and increased by the Court to $900,000. The Master in his report, in addition to the damages calculated on the basis of a reasonable royalty in the amount of $1,208,543.61 recommended that such damages be increased in "the additional sum of $600,000 as purely compensatory damages to cover the inconvenience, trouble and expense which the plaintiff has suffered by reason of the infringement and based on the fact that the plaintiff has been compelled to conduct long and expensive litigation and which the plaintiff should recover as reimbursement for what it has actually suffered * * *." There is nothing in the Master's findings or conclusions which discloses any basis for his recommendation other than that just stated. Evidently it was not based on the contention that Lincoln was a conscious and wilful infringer; in fact, as previously noted, the Master refused to make such a finding. Neither is it discernible whether he took into consideration his finding, which we have rejected, that the infringing flux was copied from the disclosure of the patent and that Lincoln did not act wholly in good faith upon the advice of counsel.

Union Carbide, in objecting to the Master's recommendation, asserted that his award on a compensatory basis should be increased to the sum of $2,000,000, and also urged the Court to allow exemplary damages. While the Court in a different setting characterized Lincoln as a conscious and wilful infringer, the increased award apparently was not based upon that premise. Judge Swygert stated:

> "The long and expensive litigation in the present case is a factor that should be considered. The evidence indicates that from 1945 to and including 1950 plaintiff's expenses covering this controversy amounted to $687,226.17.

> "Although the Master, as heretofore mentioned, gave weight to the amount of sales of special welding equipment using the patented flux in his determination of a reasonable royalty, I think consideration should be given to what Lincoln gained in other ways by its infringement, namely, (1) its profit on the sale of 660 flux and (2) the maintenance of its standing among manufacturers of welding equipment and supplies."

Union Carbide's effort in support of this award of additional compensatory damages is feeble. It argues that it would have been entirely appropriate for the Court to make an award of exemplary damages on the theory that Lincoln was a conscious and wilful infringer. This argument is fatally defective in two respects, (1) the award was for compensatory not exemplary damages, and (2) if it had been made on the latter basis, it could not stand in view of our holding that Lincoln was not a conscious and wilful infringer. Notwithstanding this situation, Union Carbide in its brief cites and relies upon the following cases in support of the well established rule that exemplary damages may be awarded where the infringement is conscious and wilful: *Russell Box Co.* v. *Grant Paper Box Co.*, 203 F. 2d 177, 183; *Overman Cushion Tire Co.* v. *Goodyear Tire & Rubber Co., Inc.*, 66 F. 2d 361, 362; *K. W. Ignition Co. et al.* v. *Temco Electric Motor Co.*, 283 Fed. 873, 880, and *Malleable Iron Range Co.* v. *Lee*, 263 Fed. 896, 901. In all of these cases and in many others which could be cited, the courts in their discretion have calculated compensatory, sometimes referred to as general, damages, and because of conscious and wilful infringement have allowed in addition exemplary, sometimes referred to as punitive, damages.

The only case cited by Judge Swygert and the only one cited here in support of the award of increased damages is *Activated Sludge, Inc. et al.* v. *Sanitary Dist. of Chicago*, 64 F. Supp. 25. (Opinion by Judge Walter C. Lindley while a District Judge.) This does not, in our view, support the award under discussion. There, the patent covered the sewage disposal system in use by the Sanitary District of Chicago. The Court, in determining general damages for infringement, was presented with an extraordinary situation. The guideposts usually found for making such determination were absent. Judge Lindley, however, as might be expected of such a great Judge, evolved a rule which he thought would do justice to the parties. In our view, the reasoning which he employed has no application to the instant situation where the facts are so vastly dissimilar. However, as it is the only case relied upon, it is entitled to careful consideration.

Referring to damages allowable under the statute, the opinion states (page 27):

> "The law is not impotent in attempting precise valuation, even though no market value exists and no loss or impairment of sales can be proved. The court, in possession of all the facts and circumstances, makes its determination from them. *Malleable Iron Range Co.* v. *Lee*, 7 Cir., 263 F. 896, *United States Frumentum Co.* v. *Lauhoff*, 6 Cir., 216 F. 610."

The opinion (page 27), after pointing out that plaintiffs' compensation may be shown by proof of an established royalty, states:

> "Otherwise it is incumbent upon the court to determine a reasonable royalty compensating plaintiffs for the value of what has been wrongfully taken by defendant. * * * and recovery is allowed as general damages but not as profits. [Citing cases.]"

The Court then made the following significant statement (page 27):

> "The evidence here, I think, is conclusive that there has not been at any time an established royalty which could be applied as measure of damages in this case. Accordingly, it is necessary to determine from

> the evidence what would be *fair general damages including a reasonable royalty,* taking into consideration the elements I have mentioned and others, by which, under the decisions of this circuit, I am bound, including the success of the patents and their use. [Italics supplied.]"

Judge Lindley was dealing with a situation where neither party was engaged in commercial production, the subject matter of the patent was not sold in the open market, there was no loss of sales by plaintiffs and no profit by the infringer. The Court heard expert testimony as to what constituted a reasonable royalty, which he rejected. It was in this context that Judge Lindley made the statement (page 36) quoted by Judge Swygert and in plaintiff's brief here, as follows:

> "As to that, I conclude that the extra damages recoverable thereunder may be punitive if the circumstances so warrant, but include also damages purely compensatory which are elusive but which plaintiffs ought to recover, not as punishment but as reimbursement for what plaintiffs have actually lost. Consequently I have carefully avoided any allowance in the nature of exemplary damages and have included only compensatory damages."

Thus, there being no established royalty and no proof from which a reasonable royalty could be determined, the Court made an award of $950,000 as compensatory or general damages. This award was not in addition to an award based upon a reasonable royalty but included the latter. In contrast, in the instant situation, an award of compensatory damages has been calculated upon the basis of a reasonable royalty and, in addition thereto and exclusive thereof, an additional award of the same character of damages in the amount of $900,000.

As pointed out in many cases, including *Activated Sludge,* in a case where no established royalty is shown it is for the Court to determine a reasonable royalty which represents the value of that which has been wrongfully taken by the infringer. That has been done in this case. Without repeating our previous discussion, it is sufficient to point out that in making such determination many factors were taken into consideration, including Lincoln's profits not only from the sale of the infringing flux but also from the sale of non-infringing items. In fact, the reasonable royalty was based upon the advantages which would have accrued to Lincoln had it negotiated a license with Union Carbide. Judge Swygert, as a basis for increasing the award, referred to plaintiff's expenses, which amounted to $687,226.17. We know of no theory which would permit the recovery of expenses as general damages. Of course, if such expenses included attorney fees or court costs, they might be allowed as such under other provisions of law. We are not here concerned, however, with that character of allowance. Other factors enumerated by Judge Swygert were or could have been taken into consideration in the determination of damages based upon a reasonable royalty. If the Court is empowered to increase a compensatory award thus calculated, the reasonable royalty theory of measuring damages is diluted to the point where it becomes meaningless.

In reaching the conclusion that the Master and the Court erred as a matter of law in the award of additional compensatory damages, we are not unaware of the statutory provision, "The court may increase the damages up to three times the amount found or assessed." (Sec. 284, Title 35.) As previously shown, however, we know of no case which has approved an increase of such damages, where, as here, the same character of damages has been calculated on a reasonable royalty basis. Also as shown, it is only on the basis of conscious and wilful infringement that exemplary or punitive damages are allowed in addition to those which are compensatory.

NOTICE OF INFRINGEMENT.

Title 35 U. S. C. A. Sec. 287 provides that patentees may give notice to the public that an article is patented by marking a notice to that effect on the package containing it. It also provides:

> "In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. Filing of an action for infringement shall constitute such notice."

The Master found:

> "At no time prior to the commencement of this action on October 1, 1945, did the plaintiff give either of the defendants any notice, either written or oral, that the Lincolnweld 660 flux infringed the patent in suit. Failure to give written notice of infringement to defendants was the result of a deliberate corporate policy on plaintiff's part, undertaken on advice of counsel."

Based on this finding, the Master concluded:

> "The defendants are not liable to the plaintiff with respect to 660 flux manufactured and sold or used prior to October 1, 1945, the date of commencement of this action."

The Court approved of the Master's finding but disagreed with his conclusion and held that Lincoln was required to account for its infringing flux sold prior to the commencement of the action.

We are favored with an interesting discussion pro and con as to whether the statutory provision requires the patentee in all cases to give the alleged infringer actual notice of infringement as a prerequisite to his right to recover damages prior to the commencement of an action. Many cases are cited by the parties in support of their respective positions on this issue. We shall not further burden this opinion by the citation or analysis of these cases. No doubt the general rule is as stated in *Dunlap* *et al.* v. *Schofield et al.*, 152 U.S. 244, 247, where the Court, referring to the notice statute, said:

> "The clear meaning of this section is that the patentee * * * cannot recover damages against infringers of the patent, unless he has given notice * * * to the particular defendants, by informing them of his patent, and of their infringement of it."

While there are cases which have excused a patentee from giving actual notice, we think they are without application to the instant situation. Here, as the Master found, the failure of Union Carbide to give notice to Lincoln "was the result of a deliberate corporate policy on the plaintiff's part, undertaken on advice of counsel." The reason for this policy, as stated by its officials, was its desire to avoid litigation during wartime activities and its apprehension that notice to Lincoln would enable the latter to file a suit for declaratory judgment and thus obtain a decision on the issues of validity and infringement.

Not only did Union Carbide fail to give notice as a matter of policy, but it refused upon request by Lincoln to advise the latter whether infringement was claimed. For instance, Lincoln in its letter to Union Carbide under date of April 13, 1943, stated:

> "The point I made to you is that we do not infringe any of your Patents, even if your Patents are all valid, which I think even you yourself are extremely doubtful regarding."

Lincoln in its letter to Union Carbide on September 8, 1943, inquired:

> "What I want you to do is to tell me just what claims of what Patents you say we infringe. I have asked you this before without any response from you."

Again, Lincoln in its letter to Union Carbide dated September 15 of the same year, inquired:

> "Meanwhile, when you do find what Patents of yours or the names of any of the Patents we are infringing, I wish you would bring the matter to our attention because I can say to you that it is not our policy to infringe anyone's Patent, and certainly not one with the Linde Company."

(These inquiries by Lincoln also bear upon the issue of its good faith, previously discussed.)

Notwithstanding these numerous inquiries, Union Carbide refused to charge Lincoln with infringement. It was determined for its own purposes to keep its patent from the scrutiny of the courts as long as possible. By doing so it was enabled to collect large royalties on its patent (asserted by Lincoln to have amounted to more than $7,000,000) which, with the exception of the four composition claims in suit, was later held invalid by the courts. The hardship, if such it be, placed upon Union Carbide by reason of the Master's conclusion is the direct result of its own action, deliberately planned and carried out for its own purpose and gain. Such being the situation, we think it cannot now escape the consequences of its intentional refusal to give Lincoln the statutory notice of infringement.

Moreover, the Court in reversing the Master's conclusion relative to the issue under discussion, stated:

> "I think it is obvious that what has been said about notice relates only to those situations where the infringer is not cognizant of his infringement. It can hardly apply to a conscious and wilful infringer."

We have previously held that Lincoln was not a conscious and wilful infringer. This holding destroys the basis upon which Judge Swygert reversed the Master and it follows that his conclusion based thereon was erroneous.

INTEREST ON AWARD.

Title 35 U. S. C. A. Sec. 284 provides for an award of damages adequate to compensate for the infringement, "together with interest." The issue is as to the period during which interest should be calculated. The Master recommended that the award "bear interest at the rate of 6% per annum from the date of the filing of the Master's Report * * *." The Court reversed the Master in this respect and awarded interest calculated from the date of the termination of the infringement in the sum of $748,185.91.

The general rule as to the allowance of interest is stated in *Duplate Corp. et al.* v. *Triplex Safety Glass Co.*, 298 U. S. 448, 459, in which it was held that "interest should run from the date when the damages are liquidated, and not, as by the present decree, from the date of the last infringement." At the same time, the Court stated, "There are no exceptional circumstances justifying a departure from what is at least the general rule." We think there is no dispute as to this general rule stated in *Duplate* and many subsequent cases. Judge Swygert, however, held that the instant case presented an exceptional situation which justified a departure from such rule. He states as a basis for his conclusion:

> "As heretofore indicated the Master correctly determined that Lincoln copied the infringing flux from the patent. Also as indicated, Lincoln's conduct was conscious and wilful."

Our previous holding that Lincoln was not a conscious and wilful infringer destroys the basis for the Court's conclusion, and again it follows that his conclusion was erroneous. We hold, as did the Master, that interest on the award should be calculated from the time of the bringing in of the Master's report.

ATTORNEYS' FEES FOR LINCOLN IN CONTEMPT ACTION.

Lincoln applied to the Court for an allowance of attorney fees in its defense of the contempt action instituted by Union Carbide. As previously noted, the District Court adjudged Lincoln in contempt and, upon appeal, this Court reversed, on the doctrine of "File Wrapper Estoppel." 196

F. 2d 103. This basis for our decision made it unnecessary to consider the findings made by the District Court in support of its judgment holding Lincoln in contempt.

Title 35 U. S. C. A. Sec. 285 provides:

> "The court in exceptional cases may award reasonable attorney fees to the prevailing party."

The Master in the instant situation found $180,000 a reasonable fee for services rendered by attorneys for defendant in that action; however, he denied the application for such allowance. The Court sustained the Master in this respect, citing and quoting from two decisions of this Court, *Laufenberg, Inc.* v. *Goldblatt Bros., Inc.*, 187 F. 2d 823, and *Wilson et al.* v. *Seng Co.*, 194 F. 2d 399. These cases and others hold that such fees are not allowed as a matter of course to the prevailing party but only in exceptional circumstances, such as to prevent gross injustice, where vexatious or unjustified litigation is shown or where the losing party has been guilty of deliberate and wilful conduct. See *Colgate-Palmolive Co. et al.* v. *Carter Products, Inc. et al.*, 230 F. 2d 855, 866; *Seismograph Service Corp.* v. *Offshore Raydist, Inc.*, 263 F. 2d 5, 28.

The principal point made by Lincoln is that "the contempt action brought by Union Carbide was baseless and, as this Court's judgment shows, 196 F. 2d 103, was known by Union Carbide to be baseless." We are not impressed with the soundness of this contention. After all, Union Carbide won its case before an experienced Trial Judge (Judge Dewey), and the fact that the decision rendered by him was reversed by this Court does not show that the action was baseless or that it was not brought in good faith. We have heretofore exonerated Lincoln and its attorneys from the charge of bad faith in its infringement of the composition claims and we think that Union Carbide and its attorneys, in the institution and prosecution of the contempt action, should be similarly exonerated. As previously noted, this question of good faith as it applies to both sides must be evaluated in accordance with circumstances as they existed many years ago and not as they have been developed in and decided by the courts. We hold that the Court was not in error in its refusal to allow to Lincoln attorney fees incurred in the defense of the contempt action.

In conclusion, we summarize as follows:

(1) We approve of the Court's rejection of the method employed by Union Carbide in its attempt to prove damages.

(2) We hold that the Court erred both as a matter of fact and of law in its conclusion that Lincoln was a conscious and wilful infringer.

(3) We hold that the Court properly resorted to the reasonable royalty method for ascertaining damages recoverable by Union Carbide.

(4) We agree with the Court's conclusion approving the Master's finding in fixing a reasonable royalty at 5¢ per pound of rod deposited, with the following reservations: (a) the Court erred in its conclusion, contrary to that of the Master, that Union Carbide was entitled to recover damages for the period prior to the filing of the complaint (October 1, 1945), and (b) the Court erred in its conclusion that Union Carbide was entitled to recover the reasonable royalty determined by the Master during the period from July 1, 1948 to June 17, 1950 (the second period of infringement). We hold that for such period Lincoln was entitled to the benefit of the rule announced in *Columbia Wire Co.* v. *Kokomo Steel & Wire Co.*, 194 Fed. 108.

(5) We hold that the Master erred in allowing Union Carbide $600,000 as additional compensatory damages and that the Court erred in increasing such damages to the sum of $900,000.

(6) We hold that the Court erred in its conclusion, contrary to the recommendation of the Master, that Union Carbide was not required, under Title 35 U. S. C. A. Sec. 287, to give Lincoln actual notice of infringement as a con-

dition to its right to recover damages prior to the filing of its action for infringement.

(7) We hold that the Court erred in its conclusion, contrary to the recommendation of the Master, that Union Carbide was entitled to recover interest prior to liquidation of the amount of its damages.

(8) We approve of the Court's conclusion denying Lincoln's application for the allowance of attorney fees for services rendered in defense of the contempt action instituted by Union Carbide.

It follows that the judgment under attack, and particularly the conclusions upon which it is predicated, is affirmed in part and reversed in part. The matter is remanded to the District Court, with directions to vacate the judgment from which this appeal comes, to compute Union Carbide's damages in accordance with the views herein expressed and to enter judgment accordingly.

UNITED STATES COURT OF APPEALS

For the Seventh Circuit,
Chicago 10, Illinois.

Wednesday, August 31, 1960.

Before

Hon. John S. Hastings, Chief Judge
Hon. F. Ryan Duffy, Circuit Judge
Hon. J. Earl Major, Circuit Judge

No. 12797

Union Carbide Corporation,
Plaintiff-Appellant,

vs.

Graver Tank & Mfg. Co., Inc. and
The Lincoln Electric Company,
Defendants-Appellees;

No. 12798

Union Carbide Corporation,
Plaintiff-Appellee,

vs.

Graver Tank & Mfg. Co., Inc. and
The Lincoln Electric Company,
Defendants-Appellants;

Appeals from the
United States
District Court
for the Northern
District of Indiana,
Hammond Division.

This cause came on to be heard on the transcript of the record from the United States District Court for the Northern District of Indiana, Hammond Division, and was argued by counsel.

On consideration whereof, it is ordered and adjudged by this court that the judgment of the said District Court in this cause appealed from be, and the same is hereby, AFFIRMED in part and REVERSED in part.

It is further ordered and adjudged by this Court that this matter be REMANDED to the District Court, with directions to vacate the judgment from which this appeal comes, to compute Union Carbide's damages in accordance with the views expressed in the opinion of this Court filed this day and to enter judgment accordingly.

It is further ordered and adjudged by this Court that the costs in these appeals be taxed equally between the parties.

In the Supreme Court of the United States

OCTOBER TERM, 1960

No. 576.

UNION CARBIDE CORPORATION,
Petitioner,

vs

GRAVER TANK & MFG. CO., INC., and
THE LINCOLN ELECTRIC COMPANY,
Respondents

RESPONDENTS' BRIEF OPPOSING UNION CARBIDE'S Petition for Writ of Certiorari To the United States Court of Appeals For the Seventh Circuit.

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The "Exhibit Volume" of the joint appendix is separately paged. Citations to that volume are by exhibit number followed by the exhibit-volume page number, e.g. "(DX 241, Exhibit Volume, p. 492)."

Citations to the two-volume printed record of the original infringement case in this Court (Nos. 184 and 185, October Term 1948, 336 U. S. 271, and No. 2, October Term 1949, 339 U. S. 605) are to "O. R." for "old record," e.g. "(I O. R. 46)."

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In the Supreme Court of the United States

OCTOBER TERM, 1960.

No. 576.

UNION CARBIDE CORPORATION,
Petitioner,
vs.
GRAVER TANK & MFG. CO., INC., and
THE LINCOLN ELECTRIC COMPANY,
Respondents.

RESPONDENTS' BRIEF OPPOSING UNION CARBIDE'S

Petition for Writ of Certiorari To the United States Court of Appeals For the Seventh Circuit.

This case, here before in 336 U. S. 271 and 339 U. S. 605, is now here on the petition of Union Carbide in No. 576 and on the petition of Graver and Lincoln in No. 604. Union Carbide's petition should be denied; the petition of Graver and Lincoln should be granted.

The case was heard below by Judge Luther M. Swygert in the Northern District of Indiana, Hammond Division, 124 U. S. P. Q. 62, upon the report of Henry R. Sackett, a lawyer in Gary, Indiana, appointed Special Master, and comes here from the United States Court of Appeals for the Seventh Circuit where appeals, separately taken by petitioner and by respondents, were heard by Chief Judge John S. Hastings and Circuit Judges F. Ryan Duffy and J. Earl Major. 282 F. 2d 653.

NATURE OF CASE.

The suit is on a patent, U. S. No. 2,043,960, owned by Union Carbide Corporation.

Union Carbide seeks review on the question of damages.

The infringing product, a welding flux, sold for approximately 10¢ per pound. The total sales amounted to $4,353,777.12. The profit before income taxes was $940,275.60, and, after taxes, $543,375.75. (Finding 45, R. 1169; Appendix to Union Carbide's petition, p. A-21; Exhibit Volume, p. 128.)

The Master, the District Court, and the Court of Appeals agreed Union Carbide proved no damages (282 F. 2d at 664-665, Union Carbide's Appendix, pp. A-76 to A-78) and that recovery, therefore, must be measured by the statutory

> "reasonable royalty for the use made of the invention by the infringer * * *." 35 U. S. C. § 284.

Where the patent, as here, is on a consumable product, the statutory "reasonable royalty," as indicated in the decided cases, will ordinarily run from 5% of selling price downward.[1]

Here, Union Carbide would have this Court restore a fantastic judgment of $3,010,077.16—nearly 70% of the total receipts from sales of the infringing product, more than 3 times the total profit before taxes, and more than 5½ times the after taxes profits.

The Court of Appeals, noting these figures, observed that the mere statement of them "presents a serious challenge to the validity of plaintiff's contention." (282 F. 2d at 664; Appendix to Union Carbide's petition, p. A-75.)

---

[1] See, for example: *Dixie Cup Co. v. Paper Container Mfg. Co.* (7 C. A., 1948), 169 F. 2d 645; *Russell Box Co. v. Grant Paper Box Co.* (1 C. A., 1953), 203 F. 2d 177, cert. denied (1953), 346 U. S. 821; *United States v. American Optical Co.* (D. C., N. Y., 1950), 95 F. Supp. 771.

The astonishing judgment entered by the District Court is explainable in part by the fact that the court assessed the statutory "reasonable royalty" by considering not only the $4,353,777.12 worth of infringing product sold, but also:

(a) $9,138,194 worth of unpatented welding equipment *usable with* the patented product (Finding 47; R. 1169; Union Carbide's Appendix, p. A-22), plus

(b) $99,124,605 worth of welding equipment not covered by the patent and *not even usable with* the patented article. (Finding 46; R. 1169, 1185, Union Carbide's Appendix, p. A-22.)

The inclusion of such materials in the standard for measuring recovery the Court of Appeals approved, hesitantly, pointing out:

> "the question, in our view, is not entirely free from doubt." (282 F. 2d at 671; Union Carbide's Appendix, p. A-90.)

Graver and Lincoln, opposing Union Carbide's petition, seek review (in No. 604) on the grounds:

1. The holding of infringement is the result of fraud worked on this Court, which, now that it has been discovered, should be purged by denial of all recovery;
2. An erroneous standard for measuring patent infringement damages has been applied.

—Patent in Suit.

The patent, as it originally issued, dominated the field of automatic submerged electric arc welding. The patent bristled with 17 claims to an asserted new process of electric welding, and also, through its 12 flux claims, covered virtually all fluxes usable in the process. (See patent, Exhibit Volume, pp. 4-6.)

—The Parties.

Union Carbide's subsidiary, The Linde Air Products Company (since merged into its parent) sued Graver, a manufacturing concern in East Chicago, Indiana, engaged in the fabrication of tanks and like products, and The Lincoln Electric Company of Cleveland, Ohio, a manufacturer of electric arc welding equipment, machinery and supplies, including the infringing welding flux known as Lincolnweld 660.

—The Prior Proceedings.

This Court held the process claims invalid.

Union Carbide says (p. 7) it lost the process on a technicality.

The technicality was that Union Carbide did not own the process. The process was the property of an earlier inventor, Robinoff, and never was lawfully part of Union Carbide's patent. (Findings 2, 11, 18, R. 1152, 1155, 1157; Union Carbide's Appendix, pp. A-6, A-8, A-11; 336 U. S. at 278; 196 F. 2d at 106.)

This Court also held the dominating flux claims invalid. They, along with the process claims, have been disclaimed and stricken from the patent. (Exhibit Volume, p. 7.)

Four flux claims, however, were here held valid, each limited to a flux "containing a major proportion of alkaline earth metal silicate * * *" (See patent, Exhibit Volume, p. 6, Claims 18, 20, 22 and 23.)

Lincoln did not use the material of the claims. It used manganese silicate, which is not an alkaline earth metal silicate. (Finding 12 on the original trial, I O. R. 925; 86 F. Supp. at 199; 339 U. S. at 610; 196 F. 2d at 105.) Union Carbide chose not to tell this Court what was known to Union Carbide's welding experts, and thus induced this Court to find Lincoln's manganese silicate an equivalent, and, therefore, an infringement. Mr. Justice Black and Mr. Justice Douglas dissented. 339 U. S. at 612.

The case now comes back to this Court on the two petitions for certiorari, No. 576 and No. 604, on the question of damages.

ARGUMENT.

Union Carbide, as ground for review, says the Court of Appeals disregarded Rule 52(a).

This is not so.

I. UNION CARBIDE SHOWS NO BASIS FOR REVIEW —ITS CLAIMS REST ON ASSUMPTIONS RECORD DESTROYS.

Union Carbide charges Lincoln was a "conscious and wilful" infringer, and that the Court of Appeals had no right to disregard such "finding."

The Master made no such finding.

But even if the Master had so found, the Court of Appeals would have been compelled to reject the finding. As the Court of Appeals pointed out, evidence, not discovered until after the Master's report had been submitted to the District Court, destroys Union Carbide's claim of "conscious and wilful" infringement, and, on Union Carbide's own sworn proofs, demonstrates that Lincoln's accused manganese silicate flux could not have been "copied" from the patent.

Here is the bill of particulars:

1. Evidence Now in Record Shows Holding Of Infringement Was Induced by Fraud.

The accused Lincolnweld 660 flux "consisted of 95% or more of manganese silicate." 196 F. 2d at 105; 282 F. 2d at 661.

That is the flux Union Carbide says was a "conscious and wilful" infringement "copied" from the Jones patent in suit. But, as the Court of Appeals observed, Union Carbide's sworn proofs, lately discovered on file in other proceedings in the Patent Office, show that:

1. It took invention, beyond Jones, and 7 years of study (by Clapp, the man in charge of Union Carbide's research laboratories) to discover that *as much as 4% to 16%* manganese could be used in a welding flux (Exhibit Volume, p. 490), and
2. It took still further invention, beyond Jones, (by Union Carbide's Miller), described as "surprising" (Exhibit Volume, p. 499), to discover that *as much as 65%* manganese could be used. (Exhibit Volume, p. 494.)

Had Union Carbide disclosed this information on the original trial, or revealed it to this Court when the case was here before, it is inconceivable that there would have been any determination of infringement. Now that the proof is here—spread of record in the two file wrappers (DX 241 and DX 242, Exhibit Volume, pp. 488-500) upon which Union Carbide obtained two other patents from the Patent Office—it will not do for Union Carbide merely to repeat the arguments that once pursuaded this Court. At the very least, explanations are due this Court. But Union Carbide, caught red-handed by the Court of Appeals, stands mute. It petitions for review of the judgment, but has nothing to say concerning the fraud now revealed.

The Court of Appeals has ventilated this subject in its opinion. (See 282 F. 2d at 661-662, and Union Carbide's Appendix, pp. A-69 to A-71.) The Court of Appeals summed the matter up in this way:

> "Thus, in résumé, the skilled representatives of Union Carbide told the Patent Office, referring to the Jones patent [*i.e.*, the patent in suit], that 'there is clearly no teaching for what purpose or in what amounts it [*i.e.*, manganese] is to be added.' In fact, Clapp found out only 'after a great deal of experimentation' that it would be possible to use as much as 4% to 16%, and this, he and his colleagues said, was 'surprising, new and unobvious,' and was 'not apparent from the teaching of U. S. patent No. 2,043,960 [Jones].' In view of this appraisement by Union Carbide's experts, *it is paradoxical that Lincoln's infringing flux with its 95% manganese silicate has been or could on any logical basis be held to have been copied from such teachings.*
>
> It is suggested that these representations made to the Patent Office are immaterial as they bear only upon the issue of infringement which has been adjudicated adversely to Lincoln. True, that issue is no longer open but, even so, it is an interesting, though futile, matter for speculation as to what the courts would have decided on the issue of infringement if they had been favored with the appraisement which Clapp and Miller later placed upon the teachings of the Jones patent. The representations thus made,

however, are relevant because they not only fortify the soundness of the opinion which Lincoln obtained from its counsel but they come close to demolishing any basis for a finding that Lincoln copied its infringing flux from the teachings of the patent and thereby became a conscious and wilful infringer." (282 F. 2d at 661-662; Union Carbide's Appendix, pp. A-70 to A-71.)[2]

Apart from the concealment practiced to produce a determination of infringement—

2. Master's Findings Destroy Union Carbide's Argument.

The Master, the District Court, and the Court of Appeals agreed infringement was doubtful. (282 F. 2d at 659, Union Carbide's Appendix, p. A-66.)

Union Carbide says infringement was "conscious and wilful." The record shows—

—(a) Master Found Infringement Doubtful; But He Did Not Find it "Conscious and Wilful."

The Master did not find Lincoln a "conscious and wilful" infringer. Nowhere in the Master's findings is there such a finding. When it was suggested to the Master—at the hearing of April 29, 1958—that in view of the wording of some of the findings, Union Carbide might argue (as it now has) that the Master found Lincoln a "conscious and wilful" infringer, the Master announced to Union Carbide's counsel, and to Lincoln's, that he had *not* found the infringement to be "conscious," or "wilful," or "deliberate." A reading of the findings will bear out the accuracy of the Master's statement; he did not find infringement to have been "conscious and wilful." To the contrary, the Master found, and both the District Court and the Court of Appeals agreed, that infringement was doubtful. (Finding 34; R. 1163; Union Carbide's Appendix, p. A-16.) The Court of Appeals pointed out:

---

[2] Emphasis supplied throughout the brief.

> "That the rights of the parties in 1942 were uncertain and doubtful is admitted on all sides. As previously shown, the Master so found and the Court approved. Union Carbide thought the issue was doubtful. The Master found that even after the Supreme Court's first decision it 'withheld payments of royalties to the inventors on the Unionmelt 50, a manganese silicate flux, until after the second decision of the Supreme Court.' At that time Union Carbide wrote to the inventors, 'There is a question as to whether Lincoln's 660 infringes the valid composition claims of the patent.'" (282 F. 2d at 663; Union Carbide's Appendix, p. A-74.)

The District Court was led to accept Union Carbide's characterization of the infringement as "conscious and wilful" (Union Carbide's Appendix, pp. A-52, A-53), but the Court of Appeals, correctly, pointed out that not only is there no finding to support such conclusion, but, on the contrary (1) the findings the Master made and the District Court approved overthrow any such conclusion, and (2) the sworn proofs Union Carbide filed in other proceedings prove the District Court's conclusion untenable. (282 F. 2d at 657-663; Union Carbide's Appendix, pp. A-62 to A-74.)

The District Court's conclusion (which the Master did not share) rests, as the Court of Appeals pointed out, on a faulty premise:

(i) District Court Applied an Erroneous Guilt by Association Test.

The District Court reasoned that Lincoln was aware of the possibility of infringement, and hence was a "conscious and wilful" infringer, because:

> "otherwise it would not have sought its patent counsel's advice about that possibility." (Union Carbide's Appendix, p. A-48; R. 1318.)

Consultation with counsel surely cannot be accepted as a badge of guilt. The Court of Appeals rightly rejected this as proof of bad faith. (282 F. 2d at 660, 663; Union Carbide's Appendix, pp. A-68, A-73.)

(ii) One Has Right to Study Patent to Determine Its Bounds.

The conclusion the District Court voiced, and Union Carbide here urges, rests upon an erroneous concept of what is and what is not a "copying" of a patent.

Union Carbide reproduces two pages of Lincoln's laboratory note books (pp. 10, 12) and argues Lincoln "simulated" the patented flux. The Court will note that what Union Carbide calls a "simulation" occurred in 1935. This was a year before the patent issued. It obviously could not have been "copied" from the patent.

The Court will also have observed that the analysis (in the third column at the middle of the laboratory page facing page 10 of Union Carbide's petition), which Union Carbide now says (p. 11) lists "the constituents for the 'simulation' " is actually an analysis *of blast furnace slag* (as the heading of the column on the exhibit itself shows; and see also R. 904). Blast furnace slag, which was old, cannot be characterized properly as a "simulation" of the Jones flux which followed it.

The Court of Appeals correctly disposed of Union Carbide's argument in these words:

"It is true that Lincoln not only procured a copy of Union Carbide's patent but also a quantity of its flux for the purpose of analysis. This, so we think, it had a right to do. As stated by this Court in *Atkins, et al. v. Gordon*, 86 F. 2d 595, 596:

> 'One may legitimately study the patent and microscopically examine the language of the claim in order to make a product which will serve the same purpose and yet avoid infringement of the patent. Such a right is the logical, beneficial result which was sought through the adoption of the comprehensive patent system of our government.'

The boundaries of the monopoly which Union Carbide acquired by its patent were defined and limited by its claims. All outside that boundary was in the public domain. We think it does not detract from the good faith of a competitor for him to procure and examine a patent and its claims, as well as the subject matter thereof, in order to ascertain what is open to the public." (282 F. 2d at 660; Union Carbide's Appendix, pp. A-67 to A-68.)

—(b) Findings Master Made Show 660 Flux Did Not Come From Patent.

Although the Master concluded that Lincoln was not a "conscious and wilful" infringer, he accepted Union Carbide's argument that the Lincoln 660 flux was "copied" from the patent. The Master was unaware of the proofs Union Carbide had filed in other proceedings in the Patent Office. (DX 241 and DX 242, Exhibit Volume, pp. 488-500.) That material had not yet been unearthed. Apart from this, not only does the Master's conclusion rest upon inadmissible views of what is and what is not a "copying" of a patent, but it is, as the Court of Appeals pointed out, overthrown by the Master's findings.

The findings the Master made, approved by both the District Court and the Court of Appeals, affirmatively show that the accused Lincolnweld 660 flux—which was 95% manganese silicate—did not come from the patent. The findings show:

1. Lincoln did not learn from the patent about the use of manganese silicate in welding fluxes. The accused 660 flux "consisted of 95% or more of manganese silicate." 196 F. 2d at 105. The Master found, and both courts below agreed:

(a) "Lincoln had knowledge independent of plaintiff's patent that manganese silicate was a useful ingredient for welding fluxes." (Finding 36, R. 1165; Union Carbide's Appendix, p. A-18.)

(b) Lincoln had used manganese silicate welding fluxes "since 1932." This, the Master found—and note this especially—was "prior to the application of Jones, et al., for the patent in suit." (Finding 21, R. 1159; Union Carbide's Appendix, p. A-12.)

(c) Lincoln had used manganese silicate in fluxes long before the 660 flux was made. Acid open hearth slag, a material long used by Lincoln in fluxes, "is a fused material." (Finding 36, R. 1165; Union Carbide's Appendix, p. A-18.) It is composed largely "of manganese silicate." (Finding 21, R. 1159; Union Carbide's Appendix, p. A-12.) The Master found: "Prior to making its 660 flux, the defendant Lincoln had used acid open hearth slag in making welding fluxes. Acid open hearth slag is a fused material consisting principally of manganese silicate and iron silicate in approximately equal proportions." (Finding 36, R. 1165; Union Carbide's Appendix, p. A-18.)

When these findings of Lincoln's long-time use of manganese silicate are compared with Union Carbide's showing to the Patent Office that a high manganese flux was not disclosed by Jones, the conclusion that Lincoln's manganese silicate flux was derived from its own prior work, and could not have been "copied" from the patent, is, as the Court of Appeals noted, confirmed.

2. Lincoln was advised by counsel that the 660 flux did not infringe. Counsel advised Lincoln that all of the process claims and certain of the flux claims were invalid (in all of which counsel was sustained when the patent was examined in the courts) "and that the 660 flux did not infringe the remaining claims of the patent." (Finding 33, R. 1163; Union Carbide's Appendix, p. A-16.)

Union Carbide brushes away counsel's opinion on the ground (p. 27) that the opinion was "obtained several weeks after production and commercial use of the infringing 660 flux." The particular opinion to which Union Carbide refers was written December 8, 1942, when less than 10,000 pounds of 660 flux had been made (out of a total of 40,998,305 pounds, Finding 45; R. 1169; Union Carbide's Appendix, p. A-21; PX 59; Exhibit Volume 97), and before it was sold commercially, or even tried anywhere except at Graver. The impression Union Carbide creates is quite inaccurate, for, *more than a year before* any of the infringing flux was made, Lincoln was advised by its counsel that:

(a) *No infringement would be involved in fusing together the ingredients of a welding flux* and grinding it into powdered form after fusing it. This is what Lincoln's counsel, Oberlin, told Lincoln in his opinion letter of July 29, 1941:

> "So far as concerns pre-fusion of your flux composition and its subsequent pulverization, we see no obstacle whatever to thus preparing the compound, irrespective of its composition." (PX 107 DD; Exhibit Volume, p. 332.)

(b) *No infringement would result from using acid open hearth slag* which is heavy in manganese silicate and has itself been fused in the open hearth furnace. On this point Oberlin, in his opinion letter of July 29, 1941, advised Lincoln:

> "slag obtained from iron or like furnaces has long been recognized as a suitable ingredient for a flux for welding iron and steel." (PX 107 DD, Exhibit Volume, pp. 326-327.)

(c) *No infringement would be involved in using any silicate provided the flux did not contain a major proportion of alkaline earth metal silicate.* Manganese is not an alkaline earth metal. Oberlin, in his opinion letter of July 29, 1941, said:

> "Since we understand that in the dual arc flux you find it unnecessary to employ a major proportion of calcium (alkaline earth metal) silicate, and since claims 18, 19, 20, 21, 22, 23, 25, 27, 28 and 29 all call for the presence of such silicates in major or predominant proportion, the only claims that remain to be considered are the following, viz: —
>
> 24. A fluxing material for electric welding, comprising metallic silicate and calcium fluoride.
>
> 26. An electric welding composition which is conductive when molten, consists chiefly of silicates, and contains about 1% to 8% alumina." (PX 107 DD, Exhibit Volume, p. 322.)

Claims 24 and 26, Oberlin advised, were invalid; the courts later so adjudged them.

Thus, *more than a year before the 660 was first made,* counsel had advised Lincoln what was open to it. It was only when Lincoln fused the non-infringing 650 flux—to produce the 660—that, as it later turned out, infringement, as held by the court, resulted. But that step counsel, more than a year earlier, had advised Lincoln it could safely take without infringing.

Now, then, when counsel tells his client what is within the open art, and the client compounds a material within the limits of what he is told is open, it is not right to say he "copied" the product from the patent. Here it was the other way around. Counsel advised Lincoln as to what it could rightfully do. Lincoln acted on that advice.

Not only was Lincoln told in advance by counsel what it could lawfully do, but, after the 660 was tried out at Graver and before it was marketed to anyone else, Lincoln went back to counsel. Counsel again examined the question. Counsel concluded:

> "The composition of your present flux is clear of infringement of all but one claim of the Linde patents, viz. claim 24 of patent No. 2,043,960 to Jones et al., which covers broadly
>
>> 'A flux material for electric welding comprising metallic silicate and calcium fluoride.' " (DX 176, Exhibit Volume, p. 461.)

This claim counsel considered invalid and the courts so held it.

The Master, the District Court, and the Court of Appeals agreed that this was the "good faith opinion of a competent and conscientious lawyer." (Finding 35, R. 1164; Union Carbide's Appendix, p. A-17; 282 F. 2d at 658.)

The Court of Appeals summed up the matter in this fashion:

> "Lincoln in developing its infringing flux acted upon the opinion of its patent counsel, Honorable John F. Oberlin, admitted on all sides as an experienced and highly competent lawyer in the field of patent law. Oberlin investigated many process, equipment and flux patents in connection with a 'dual-arc process' then being developed by Lincoln. He advised Lincoln that pre-fusing the ingredients of a flux was an old step and that Lincoln could pre-fuse any flux without infringing, so long as it did not contain a major proportion of alkaline earth metal silicate as demanded by the claims. Long before the 660 was first made, he advised Lincoln extensively as to what it could and could not do in respect to welding fluxes. After the 660 had been tested at Graver and before it was placed on the market, Lincoln submitted it to Oberlin to obtain his specific opinion as to whether it could be sold without infringing the patent. By a written opinion dated December 8, 1942, after careful study of plaintiff's patent and the prior art, Oberlin advised Lincoln that plaintiff's asserted patent monopoly over the automatic submerged arc welding process was void, that the broad flux claims were void and that Lincoln's 660 flux did not infringe any of the remaining claims. Oberlin's opinion was vindicated by the courts in all respects except that pertaining to the four claims in suit, which the courts held valid and infringed on the doctrine of equivalents. Even as to these claims his opinion that they were not infringed was agreed to by two dissenting Justices of the Supreme Court." (282 F. 2d at 658-659; Union Carbide's Appendix, pp. A-64 to A-65.)

In face of these findings, approved by both courts below, it is idle for Union Carbide to talk about disregard of Rule 52(a).

Better it explain how that which Union Carbide in the Patent Office swore was "invention" *over* the Jones patent in suit, came to be palmed off in this Court as "conscious and wilful" infringement "copied" *from* the Jones patent in suit.

3. Claim of Loss Union Carbide Urges Was Rejected by Master and by Both Courts.

Union Carbide assures this Court (p. 15) that its loss was $8,851,234.

The Master found, and both courts below agreed, that was *not* Union Carbide's loss.[3]

The $8,851,234 Union Carbide calls its "loss" is a *computed* figure, based on assumptions the Master and both courts below found to be *contrary to fact*.

The Court of Appeals summarized the record on this point in the following manner:

> "Union Carbide in its brief states that Peter Pirnie, Jr. was chief accounting officer in charge of its books and records and supervised the preparation of the accounting statements. Lincoln asserts in its brief that the technique employed by Union Carbide in combining the figures on flux with royalties on the invalid process was 'devised specifically for this case.' There is support for this accusation. Pirnie testified that he mixed flux with other products even though it would have taken less time to give the figures on flux alone. He testified that he did this because 'that is the way I was asked to develop the situation, and

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[3] Findings 51-53, R. 1171-1172; Union Carbide's Appendix, p. A-24; Finding 73, R. 1179; Union Carbide's Appendix, p. A-31; Master's Conclusions of Law 5, 8 and 12, R. 1182-1184; Union Carbide's Appendix, pp. A-34 to A-35; District Court's opinion, R. 1312-1314; Union Carbide's Appendix, pp. A-43 to A-44; District Court's Conclusions of Law 3, 4 and 11, R. 1326-1328; Union Carbide's Appendix, pp. A-55 to A-57; Court of Appeals opinion, Union Carbide's Appendix, pp. A-75 to A-78, 282 F. 2d at 664-665.

that is the way we set it up,' and 'I am not setting the policy in this particular case.' Pirnie was asked, 'Then there is nothing in your former treatment of the breakdown of this composite Unionmelt enterprise that indicates any reason for combining the flux sales with the license income as one category, and the other two items, Unionmelt equipment and Unionmelt rod as another category?' and responded, 'I don't know. This was done according to the way people at that time in charge wanted it done, I suppose, and that is how we did it. * * * 'I did what I did per—in accordance with the request of our counsel.'

Union Carbide's method of computing its loss as a basis for the award of damages was rejected by the Master and confirmed by the Court." (282 F. 2d at 665; Union Carbide's Appendix, p. A-77.)

II. NO QUESTION ARISES UNDER RULE 52(a)—UNION CARBIDE'S PETITION SHOULD BE DENIED.

Nothing in Rule 52(a) requires a reviewing court to abdicate the reviewing function.

The Court of Appeals made clear its full awareness of the rule. And its painstaking analysis, illuminated by its opinion, shows that the Court was faithful to its obligation.

CONCLUSION.

The writ of certiorari sought by Union Carbide should be denied; the writ sought by Graver and Lincoln in No. 604 should be granted.

Respectfully submitted,

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January 6, 1961. *Counsel for Respondents.*